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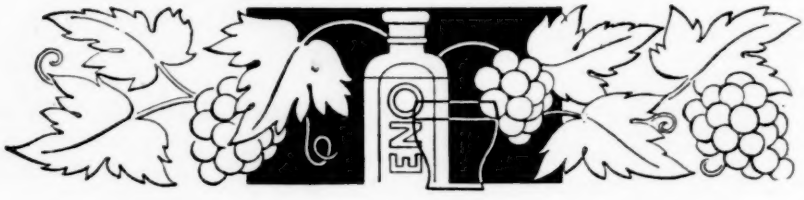

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ADDRESSES AND ORIGINAL ARTICLES

THE BIRTH OF CHEMICAL BIOLOGY.

The Harveian Oration delivered before the Royal College of Physicians of London on Oct. 18th, 1930,

By J. B. Leathes, M.B. Oxf., F.R.S.,

FELLOW OF THE COLLEGE; PROFESSOR OF PHYSIOLOGY IN THE UNIVERSITY OF SHEFFIELD.

We meet here on St. Luke's day to honour the wish of William Harvey, and carry out the terms of the deed of gift which he assigned to the College in 1656. Harvey's wish, you remember, was that there should be once every year "a commemoration of all the benefactors of the College," and that this commemoration should keep alive in us the desire "to imitate these benefactors, to contribute our endeavours for the advancement of the Society according to their example, and to search and study out the secrets of Nature by way of experiment."

In any such commemoration we cannot but remember the many ways in which Harvey himself was a benefactor of the College. For 50 years a Fellow, he served as treasurer for many, down to 1629; for 40 years he was Lumleian lecturer in anatomy and surgery, to which post he was appointed in 1615; at his own cost he built for the College "a great parlour or convocation house for the Fellows to meet in," with a library and museum above it, which was opened in 1653 with a ceremony sumptuously provided by himself. This hall was built apparently over the court or garden of the premises at Amen Corner, which recently, by the generosity of Dr. Hamey, had been bought for the College. Here, in the year before Harvey's gift, the College had set up his statue.

When Harvey first became a Fellow in 1607 the College meetings were still held at Linacre's house in Knightrider-street, as they had been since 1518. But in 1614 the rooms at Amen Corner were rented from the Chapter of St. Paul's, and 35 years later Dr. Hamey relieved the College of the burden of the annual rent by his purchase and gift. Harvey's hall and library were furnished by him, and equipped with books and with instruments at the time, and in his will he left "to the College of Physicians all my bookes and papers and my best Persia long Carpet and my blue sattin imbroyedyed Cushion, one paire of brasse Andirons with fire shovell and tongues of brasse for the ornament of the meeting rooms I have erected for that purpose." But buildings and contents, and the statue of Harvey as well, were destroyed a few years later on the fourth day of the great Fire. After that the new College buildings in Warwick-lane, built by Wren and Robert Hooke, were not opened till 1674. These buildings served the College for 150 years down to 1825, when the rooms in which we are met came to be, as they have now been for three generations, identified with the College.

In more than 400 years there have been but four buildings that have been the College of Physicians. If and when in the fifth century of the life of the College there is to be a fifth, the benefactions of Hamey and of Harvey for the second cannot be forgotten.

But it is not only benefactions such as these that we are bidden to commemorate. Our commemoration is to be of those who have built for all time, "who have sought and studied out the secrets of Nature by way of experiment" and thereby made this College, if they were members, a house of Fame, and, if not, none the less have deserved well of it. Even in a legal document for the transfer of an estate this single-minded benefactor could not fail to make clear what in his opinion was the highest claim to commemoration, as his whole life had shown, "the inquiry of truth which," in the words of his contemporary, "is the lovemaking and the wooing of it."

Harvey's Later Years.

Harvey was 50 when he published the "de Motu Cordis et Sanguinis," and had already been attached to the Court as physician extraordinary to the King for ten years. Four years later he became physician-in-ordinary to Charles I. Notwithstanding his duties at Court, and his practice both at St. Bartholomew's and among his private patients, and in spite of the political troubles of the times, he continued to make opportunities for pursuing his search into the secrets of nature, amassing materials for the remarkable work which he was at last persuaded to publish in 1651 when he was 73 years old, the "de Generatione Animalium." "During a long series of years," he tells us there, "for three months in the autumn and winter almost every day I had the opportunity of dissecting numbers of hinds and does" in the royal parks and forests for the study of this subject, not only hunted animals, but also animals set apart for his special use. Week by week the changes are recorded from September on to the end of December. And though perhaps less systematically countless dissections of other viviparous animals during pregnancy he carried out as well. This was in the years before the war, the year 1633 he specially notes as an exceptionally early rutting season.

In 1642, after the battle of Edgehill, he was in Oxford, apparently till its fall in '46. Of that time Aubrey says: "I remember he came several times to our College (Trinity) to George Bathurst, B.D., who had a hen to hatch eggs in his chamber, which they opened daily to see the way of generation." When Oxford fell he gave up the Wardenship of Merton, to which he had been appointed in the previous year, and returned to London or its neighbourhood. There we know he found that much of his most valued material, on the generation of insects, "the fruits of many years' toil, had not only with the permission but by command of Parliament been abstracted by my enemies from my museum," when his house at the same time was stripped of all its furniture. These notes, that perished also, must have been collected during the busiest years of his life before the war.

He was now 68, and from this time he lived with his brothers either in London or in its neighbourhood, "finding solace in my studies and a balm for my spirit in the memory of my observations of former years." The "de Generatione" is therefore remarkable if only as witness to the single-minded constancy of a busy man "wooing and making love to truth" through half a lifetime. That it profoundly influenced the growth of knowledge as did the "Opusculum Aureum" of 1628 cannot be maintained. That it is free from "that philosophy of discourse and disputation into which we are betrayed by the forces of our own minds" is too much to say. What work of those days was if we except the "de Motu Cordis"? But it contains a mass of observation the result of

sustained thought, unwearying anatomical studies, and, as has been so well put before us in recent years by Dr. Herbert Spencer, his watchful attention to a wide clinical experience. Naked-eye anatomy could do no more. It is easy to reflect that it was already possible for the anatomist not to confine himself to naked-eye observations. Harvey used a lens, but the compound microscope had been constructed a good many years before this book appeared. Had the distractions of the times been less cruel it would hardly have been left for Malpighi, 50 years younger than Harvey, to reap the first harvest of microscopic anatomy in the years immediately following Harvey's death. Swammerdam indeed made the first observation of blood corpuscles within a year, and the histological publications of Malpighi began with the "de Pulmonibus" three years later. But the microscope has not even now solved the riddles of generation; we can indeed say pretty confidently that it will not. Such was the quest on which Harvey was concentrated for 30 years.

The Physiology of Respiration.

In the seventeenth century modern physiology was born; its birth was attended by two miracles. The first was the miracle of 1628, when Harvey bade medicine take up its bed and walk, and the delusions of 1400 years' enslavement to authority and tradition were swept away by the evidence of independent observation and experiment, one of the most remarkable chapters in the history of human thought. The other was the miraculous birth of the physiology of respiration ten years after Harvey's death.

There are passages in the "de Generatione" and the tract on "Parturition" which suggest that Harvey was struggling to emancipate himself from the current doctrines of the functions of the lungs and blood. "Whether the object of respiration is really to cool the animal shall be discussed elsewhere at greater length"; and after giving good reasons for a different account he says:—

"If anyone will carefully attend to these circumstances and consider a little more closely the nature of air, he will allow, I think, that air is given neither for the cooling nor the nutrition of animals. It is as if heat were rather enkindled within the fœtus than repressed by the influence of air. Thus, much by the way on the subject of respiration; hereafter perhaps I may treat of it at greater length."

But there is no evidence that his own ideas of the nature of air would have furnished the answer to his questionings.

He died in 1657. Robert Boyle, who had settled in Oxford three years earlier, was that very year at work with Robert Hooke upon his air-pump. It was completed in 1659. He published his first account of the "New Experiments Physico-mechanical Touching the Spring of the Air" a year later, and 1661, the date of the second edition, is the date of Boyle's "Law."

The Five Tracts of John Mayow.

In 1658, a few months after Harvey's death, John Mayow in his eighteenth year went as a commoner at Wadham to Oxford, where Boyle had been working for three or four years. Two years later Mayow, in 1660, was elected a fellow of All Souls, where he studied law and took his bachelor's degree in 1665 after five years. He was, we are told, exempted from taking orders because he was also studying physic. In '68 he published his first tract, "de Rachitide"; the following year his second, "de Respiratione"; and in the next year, 1670, he took his doctorate of law.

ON RICKETS.

The "de Rachitide" is interesting first of all as in it we see how Mayow was saturated with the medicine of his day.* It opens thus:—

"There has been only one so far as I know who has written anything on the subject of rickets—namely, the distinguished Dr. Glisson, and that may seem strange, because as a rule disease as it stalks through the land cannot keep pace with the incurable vice of scribbling about it." "The disease," he goes on, "made its appearance some 40 years ago in the western parts of England and since then has infested infants' cradles through nearly the whole of England though more rarely the northern part of it."

Now that the causation of rickets is known, it would be an interesting subject for economic and historical research to trace, if this record is true, the cause of the appearance of this disease at that time and in those parts. He argues that the defective nutrition is not a defect of the blood. Nutrition, according to the ideas of that day, was conveyed also by the nerves. He shared this idea because, he says,

"everyone knows when a nerve is cut not only is sensation lost, but nutrition suffers. Moreover, when in an experiment on a dog I have accidentally wounded a nerve, on dissection after about three months I have found a fairly conspicuous glandular concretion where the nerve had been cut and this seemed to have its origin from the nervous juice escaping from the wound of the nerve."

Upon the nature of the contribution of the nerves to nutrition he gives his views in other places. Here he merely says that the nervous juice meeting and mixing with the blood produces a certain vigorous reaction and heat ("effervescentiam"). The sections at the end on the treatment contain many prescriptions which for those not familiar with the details of seventeenth century therapeutics are a revelation. The inclusion of 6 drachms of fresh butter in some of these is an accidental anticipation of modern practice; but it were better that we should not commemorate his advice that it should be administered in an extract *fimi equi non castrati recentis*.

ON RESPIRATION.

The tract on "Respiration" of 1669 is much more important. The first question he deals with, the entry of air into the lungs, at once shows the school in which he had studied.

"Some," he says, "attribute it to the abhorrence of a vacuum, or some fanciful attraction, others think that the air displaced by the expanding chest pushes adjacent air through the nose and mouth into the lungs, as if the air had an unalterable volume. Whereas if a fairly large bottle with a narrow neck be held to the mouth and the nostrils are closed, air is easily drawn into the lungs through the mouth from the bottle, though the surrounding air cannot be pushing it. The entry of air is effected by its elastic property, so clearly demonstrated by Boyle, and by the pressure of the superjacent air on that which is nearer the surface of the earth." . . .

"When a bladder squeezed nearly empty of air is tied at the neck and put into a glass from which the air is then pumped out, it is seen to swell however little air was left in it as soon as the pressure of the air outside it is removed."

In the second edition of this tract, published five years later, he adds the well-known experiment, which more aptly illustrates the entry of air into the lungs, in which the bladder is tied to the inner end of the pipe of a bellows, the valve hole of which has been closed with a glass window; as the blades of the bellows are separated the bladder can be seen to swell with air, entering it through the pipe and driven in by the pressure of the atmosphere.

"The structure of the lungs is adapted for their inflation in this way for they consist, as Malpighi has shown" (eight

* Foster mistakenly says that medicine was not Mayow's profession, and that it was law that he practised in the summer at Bath.

years previously), "of a system of most delicate membranes arranged so as to form an almost infinite number of orbicular vesicles communicating so that the air can pass from the trachea into them one after the other and inflate them as the lungs expand."

His description of the enlargement of the chest was in more than one respect for the first time correct, and particularly in that the double articulation of the ribs with the spine, which he was the first to describe in the second edition, 1674, owing to its obliquity when the ribs are raised causes not only the sagittal but also the lateral diameter of the chest to be enlarged. The importance and mode of action of the diaphragm, the significance of orthopnœa, and the small part played by muscular action in ordinary expiration are all clearly set forth.

But it is in the account of the use of respiration that the important revolution appears. The ideas that had been advanced before were three: (1) that the entry of air cooled the blood; (2) that the expansion of the chest drove the blood through the lungs; (3) that the passage of air in and out of the lungs so mixed and agitated the blood that the separation of fluid from solid, known to take place when blood was left to stand at rest outside the body, was prevented.

As to the first of these, he insists that air is necessary for activity and the generation of heat not for cooling the blood. This is a cardinal fact for him and is fully developed later. In the first instance, he may have owed this idea to Harvey, as we have seen. Secondly, the movements of the chest are not necessary for the pulmonary circulation to be carried out, though he recognises that they help it: blood injected into the pulmonary artery of a dead animal reaches the left ventricle without difficulty, and one has only to hold one's breath and feel one's pulse to recognise that plenty of blood circulates, although the lungs are not moving.

And, finally, that the air does not merely mechanically agitate the blood and so ensure it being properly mixed, as Malpighi maintained, in his letter to Borelli, "de Pulmonibus" 1661, is clear; "since any air, however often it had been breathed, should be equally effective for this purpose; but air that has been breathed repeatedly cannot maintain life." He quotes, too, "the experiment recently shown at the Royal Society," in which a dog with its chest opened was kept alive by a stream of air driven from a bellows through the trachea and escaping by punctures at the surface of the lungs. He does not mention that it was shown by Hooke, perhaps because a similar experiment had been done by Vesalius. But Hooke, and Mayow too, realised the importance of the experiment as showing that it was not necessary for the lungs to move in order that the animal should live, provided fresh air was supplied. If with the lungs distended to the same degree the dog's nose and mouth were closed it died.

"We may, therefore, state positively that something absolutely necessary to life is imparted to the blood by the air which is breathed; and when this, whatever it is, is exhausted the air becomes useless and no longer fit for respiration." . . . "Expiration has also this further use that in the expelled air certain vapours that exhale from the blood are at the same time blown out."

This last, however, is a point which he did not later attempt to develop.

"What it is in the air that is so necessary for life it is not easy to define. It probably is certain very volatile nitrous particles abundant in the air which are communicated through the lungs to the blood. This aerial nitre is so necessary for every form of life, that even plants will not grow in soil deprived of it. Even plants seem to have a kind of respiration and require air.

"What rôle this aerial nitre plays in animal life is our next enquiry. It appears that when duly mixed with combustible components of the blood it brings about a certain reaction not in the heart alone, but in every muscle that moves,"

in the heart because it is a muscle and, therefore, in its substance rather than in its cavities. For:

"it is necessary for every movement of the muscles, and without it there could be no movement of the heart; the more violent the movements the more intense and more frequent the respiration, because there is great expenditure of this explosive nitre made necessary by the chemical changes in the contraction of the muscles, and also, in the accelerated action of the heart which is made necessary by the richer flow of blood to the muscles.

"To this I add that it is proved by the experiments of the most illustrious Boyle that flies, bees, and other insects, after being cut through the middle can neither move nor live in a place void of air, though in the air they move for some time. These small animals, therefore, that have neither blood nor hearts nor lungs, at all events, in their divided parts, must needs have air it would seem for no other purpose but movement alone."

I have dealt in detail and quoted freely from this first treatise on respiration of 1669 because, while it is short and was written without the fuller development of experimental evidence that is found in the better-known publication of 1674, the position is made clear; the discovery of oxygen, aerial nitre, as a component of the air and its physiological importance is clearly outlined. A new planet swims into our ken.

MAYOW'S CONTEMPORARIES.

That Boyle had been an inspiration to Mayow is also clear. But there had been other influences. Robert Hooke went up to Christ Church from Westminster in 1653, in the year before that in which Boyle settled in Oxford; he was five years older than Mayow, eight years younger than Boyle. Even at school he had been experimenting with flying machines. He soon attracted the attention of the Warden of Wadham, Dr. Wilkins, who introduced him to Willis and so to Boyle. Hooke, we know, was working with Boyle at the construction of his air-pump already before Mayow went up to Oxford. The "Micrographia" was published by Hooke in 1665, four years earlier than the first "de Respiratione." In this work "the ingenious Mr. Hooke," as Mayow calls him, had revealed himself in the first place as a born experimenter, a genius, if a rather discursive one. But he had also expressed ideas very similar to those used by Mayow, though in a totally different connexion. He had examined with the microscope the structure of wood charcoal, "an object no less pleasant than instructive," and he proceeds to describe the dry distillation of wood and the part played by air in the process. He speaks of air as a menstruum in which combustible materials dissolve with liberation of heat and, if the process is sufficiently energetic, of light.

"This dissolution of combustible bodies is made by a substance inherent and mixt with the air, which is like if not the very same, with that which is fixt in saltpeter, which by multitudes of experiments that may be made with saltpeter will, I think, most evidently be demonstrated."

"Moreover," he adds, "the dissolving parts of the air are but few, and therefore a small parcel of it is quickly glutted, and will dissolve no more and therefore, unless some fresh part of this menstruum be apply'd to the body to be dissolved, the action ceases and the body leaves to be dissolved and to shine, which is the indication of it, though placed in the greatest heat; whereas, saltpeter is a menstruum when melted and red hot, that abounds more with those dissolvent particles, and therefore as a small quantity of it will dissolve a great combustible body so will the dissolution be very quick and violent. Therefore, as in other solutions, if a copious and quick supply of fresh menstruum, though but weak, be poured on or apply'd to the dissoluble body it quickly consumes it. So this menstruum of the air if by bellows or

any other such contrivance it be copiously apply'd to the shining body is found to dissolve it as soon and as violently as the more strong menstruum of melted nitre."

There is so much in this that is entirely new, and so much that appears again, mutatis mutandis, in Mayow's experiments and arguments that it is clear there must have been intimate communion between the two. Mayow, indeed, has been charged with plagiarism. It would be as fair to make this charge and perhaps easier to maintain it, against Hooke; he published the ideas first and Mayow was then 25 and unknown; when Mayow put them out Hooke was well known and in middle-life; not a good subject to play that game on. And, as a matter of fact, similar ideas appear in Lower's "de Corde" (Chap. V., published in the same year as the first edition of Mayow's "de Respiratione." Lower speaks of the nitrous spirit of the air passing into the blood, and states as a dictum "wherever fire can burn with ease we can breathe with ease," a fact established by the experiments described by Mayow). But here, too, there is no attribution to Hooke, nor for that matter to Mayow. But the fact that it was Hooke who proposed Mayow for the Royal Society in 1678 makes it likely that there was no plagiarism, but that Mayow, as a close student and admirer of Boyle, was also intimate with Hooke, and that they worked together, and Lower too, without stopping to define who had thought first of each experiment or each deduction. That Mayow added nothing is certainly not the case. To begin with, he was a physician and Hooke was not; his first philosophical interest was biology; Hooke was merely incidentally interested in biological science. Gifted with exceptional mechanical ingenuity, when a boy at Westminster he is said to have invented "thirty several ways of flying." His contribution to science was in the contrivance of experiments of all kinds; as a microscopist he was interested in the structure of charcoal and in explaining why it is black more than in the structure of the living plant. "It is not my design to examine the use and mechanism of these parts of wood, that being more proper to another inquiry," which he leaves alone. He graduates thermometers, but not for physiological experiments. It is in contributions to the technical perfection of the air-pump, and his machine for cutting cogs in clock wheels, that he was at his best. In the preface to his book he says he has "gleaned up here and there a handful of observations in the collection of which I made use of microscopes and some other glasses that improve the sense"; just a discursive miscellany. There, too, he defines his own position in science.

"It is the great prerogative of mankind above other creatures that we are not only able to behold the works of nature, or barely to sustain our lives by them; we have also the power of considering, comparing, altering, assisting, and improving them to various uses. By the helps of art and experience some men excel others almost as much as they do beasts. By the addition of such artificial intruments and methods there may be in some manner a reparation made for the mischiefs and imperfection mankind has drawn upon itself by negligence and intemperance and a wilful and superstitious deserting of the prescripts and rules of Nature."

As a philosopher he was typical of the best that the seventeenth century was doing for experimental science. The remedy for the errors of human reason can only proceed from the substitution of

"the real, the mechanical, the experimental philosophy for the philosophy of discourse and disputation that chiefly aims at the subtilty of its deductions and conclusions without much regard to its first ground work." . . . "All the fine dreams of opinions which the luxury of subtil brains has devised would then quickly vanish and give place to solid histories, experiments and works." . . . "The links upon which true philosophy depends are to begin with the hands and eyes, to proceed on through the memory, to be continued by the reason; nor is it to stop there but to come about to the hands and eyes again and so by a continual passage round from one faculty to another it is to be maintained in life and strength as much as the body of a man is by the circulation of the blood through the several parts of the body, the arms, the feet, the lungs, the heart and the head."

He was, indeed, worthy of a place in the great quartet of Oxford students, who in the decade following Harvey's death were led by Boyle; but Boyle was first fiddle, Hooke second, and the subjacent biological ground-tones were supplied by Lower and Mayow.

Mayow did not merely hang himself on. If Boyle and Black and Cavendish are the great names in the share that this country had in the creation of physical chemistry, Mayow's is great for the part he played at the birth of biological chemistry, a science to which chemistry owes as much as biology, and without which chemistry would have but three legs to stand on. If the ideas in his work did not all originate with him (the evidence does not make it clear that they did not), by his own experiments he not only established them and made them his own, he extended their implication into fields of thought that meant much less to other members of the team with which he worked.

The ideas are there in this first edition of the "de Respiratione" published in '69, the year after Boyle moved to London. Five years later, in the "five tracts," they are extended, enlarged, and the experimental foundations for them given in a way which amply justifies the place that this estimate of his work assigns him.

LACK OF CHEMICAL DEFINITIONS.

It is difficult for us to-day—at first reading I, at any rate, found it impossible—to do justice to Mayow's "de Sal Nitro," the most important of the five tracts that appeared in 1674, two of which are merely new versions of the earlier ones. When he wrote hardly any of the terms, hardly any of the ideas which are the alphabet of chemistry had been defined. The mists and vapours of the middle ages obscured everything. It is universally recognised that in order to understand the greatness of what Harvey did it is imperative to know what had been before; how in the history of human thought Greece and Rome had had to pass away, a new civilisation to arise, and after seven centuries also pass away, and yet two centuries more go by before the light shone out that was lit by Harvey. But in that field the Renaissance had then been at work for three generations, even if we disregard all anatomy before Vesalius.

The Renaissance had done nothing for chemistry. Van Helmont, almost exactly Harvey's contemporary, was the only forerunner in the seventeenth century, Paracelsus in the sixteenth, Basil Valentine in the fifteenth. Van Helmont was hardly more clear of mediæval entanglements than Paracelsus. It is true he weighed the growth of a tree and proved that the increase of weight did not come from the soil. But he concluded that the tree must be made out of water, and argued that the gas into which it was converted when burnt was also transformed water. The "incoercible" gas, "gas sylvestre," given off by fermenting grapes was no less water. In the six fermentations which he is at pains to describe by which food is assimilated to form the living body there is hardly anything that we can recognise as conforming to fact, as there is nothing that rests upon accurate observation or experiment.

Paracelsus or the Arabs themselves could have done as well.

There are but few sidelights on the position of chemistry at the time in England. The sagacious Harvey, we are told, "did not care for chymistry, and was wont to speak against the chymists." In a well-known passage John Wallis, Sedleian professor of geometry, describes the society of philosophers that met weekly in London, from at any rate 1645, out of which the Royal Society arose, and how

"about 1648 some of our company being removed to Oxford our company divided, those in London continued their meetings there, those of us in Oxford did likewise and brought those studies into fashion there, meeting first at Dr. Petty's lodgings, *in an apothecary's house because of the convenience of inspecting drugs.*"

But there were no chemists of the company. Afterwards the meetings were held at Wadham at the lodgings of the Warden, Dr. Wilkins, later—some time after 1654—at those of the Hon. Robert Boyle. In 1659 we are told by Anthony Wood, the antiquarian and gossiping historian of Oxford notables, that Boyle brought from Strasbourg "the noted chemist and Rosicrucian Peter Sthael" to lecture in Oxford, and settled him in the house next door to his own lodgings so that the "elaboratory" which he had there might be convenient for Sthael's use. Sthael apparently lectured for some years; for in 1663 Anthony Wood himself attended. "The club consisted of ten at least"; he mentions names, among them not Mayow's, but "John Lock, of Ch. Ch., afterwards a noted writer," also, you remember, a physician.

"This John Lock was a man of a turbulent spirit, clamorous and never contented. The club wrote and took notes from the mouth of their master who sat at the upper end of the table but the said John Lock scorned to do it so that while every man else would be writing he would be prating and troublesome."

Boyle therefore, one of the inquiring minds who were putting into practice what Bacon had preached, was, unlike Harvey, interested in chemistry. But after the first year of Sthael's course, which he presumably followed, he published, anonymously, it is true, to spare no doubt the feelings of his protégé, a destructive criticism of the chemical philosophy of the day, "The Sceptical Chymist." It should have long been clear that the four elements of the Peripatetics could not suffice when experimental chemistry began. But the name of Aristotle kept them in sway, and experimental chemistry had been limited to the action of fire and the use of crucibles and retorts inherited from the alchemists. The empirical chemists since Basil Valentine, who appear to have been seldom great thinkers, had supposed that the properties of different forms of matter depended on the proportions in which the Tria Prima occurred in them, volatile mercury, combustible sulphur, and incombustible non-volatile salt. Paracelsus dreamed of a whole system of medicine based on this sort of chemistry. In the "de Origine Morborum ex Tribus Primis Substantiis" he says:—

"when you take a bit of wood into your hand, your eyes tell you it is a bit of wood, a single substance; that is no use; a rustic can see that. You will see deeper below the surface and know that what you hold in your hand is mercury, sulphur and salt. It is not till you recognize this that you can be said to see with the eyes of a true physician. He can see this as clearly as the rustic his bit of wood; and what is true of the bit of wood is true of the human body. Whatever burns is sulphur" (and he instances resin, gum, turpentine, fat, butter, oil, and strong wine), "whatever smokes or can be sublimed is mercury, whatever is left as ash is salt."

Bacon commended and adopted this system of the chemists, and in 1622 published the outline sketch of a work he had planned, "Historia Sulphuris Mercurii et Salis."

Now that people were beginning to use their hands and eyes in the inquiry of truth and to think clearly it was easy to see that this would not do. But in the "Sceptical Chymist" there is little that is constructive.

NITRE AND OXYGEN.

Mayow therefore found in chemistry no terms that had been defined, only such as meant one thing at one time and another at another.

"Among the elements of the Peripatetics," he says in the fifth chapter of the "de Sal Nitro," "the two chief are fire and air. For these two our nitro-aerial Mercury" (i.e., oxygen) "might justly be substituted, since it possesses a really fiery nature, and constitutes also the most active part of the air. As to the 'spirit' of the chemists" (that is Mercury), "which usually heads their array of elements, what they mean by this high-sounding term I simply cannot understand: for the spirits of fermenting liquors which flare up when thrown on the fire should be included in another element of the chemists which they call sulphur" (meaning combustible matter); "while the corrosive spirits" (spirit of salt, spirit of vitriol, spirit of nitre) "should be dealt with among the salts" from which they are obtained. "If the word spirit is to be retained it is more appropriate for the nitro-aerial particles in the air, at one time executing motions that are placid, at another the most violent imaginable."

"In the census of the elements sulphur deserves the next place because after our mercury it is the most fermentative. It too may at one time be sluggish and inert, at another attain full vigour and maturity or even be untameably wild. From the conflict between these two" or as we should say from the oxidation of organic substances "all the mutations in nature seem to arise."

Then come the salts, which include both the acids and the alkalis, whether fixed or volatile, of which salts in the modern sense are formed. In actual use the term "purely saline salt" means alkaline ash; "acid salt" means the acid component of a neutral salt. Salt of tartar would be potassium carbonate, salt of wormwood the ash of wormwood." For the rest there is the ubiquitous water, and no less ubiquitous terra damnata, the lifeless earth, dead and damned, that may be left to mineralists.

That is at least a beginning, a scheme that provides a setting for what to Mayow, the biologist, is the cardinal fact in chemistry, that not only the heart but the whole body lives and moves by the union of oxygen with fuel carried by the blood.

The basal facts upon which he builds are two: first, that in the air there is some one and the same thing, having the same physical properties as the rest of the air, but forming only a comparatively small part of it, which is necessary alike for burning and for supporting life; the second, that in nitre this same thing is present, and for this reason combustible matter will burn if mixed with nitre even in the absence of air.

It is with the second of these themes that he deals first in the opening chapters of the most important of the Five Tracts, the "de Sal Nitro." Nitre can be found in the soil only when air has access to it; the air then contributes something. But the soil certainly contributes something too, "for nitre is formed in greater abundance in soil impregnated with fixed or volatile salt, as in the neighbourhood of stables, dovecotes or slaughter-houses, and also from soil containing quicklime or ashes." And he knows that when nitre is heated with tartar the acid spirit of nitre escapes, and much more alkaline ash is obtained than is obtained by heating tartar alone, so that nitre contains some fixed salt. This fixed salt is also obtained from nitre when it is heated with oil of vitriol so as to drive off the acid spirit of nitre, the fixed salt being left as the vitriolate, which had all

the medicinal and other properties of vitriolate of tartar (potassium sulphate). And similarly true nitre can be made by neutralising spirit of nitre with salt of tartar (potassium carbonate). Therefore the fixed salt in nitre certainly is derived from the soil. The other component of nitre, the acid spirit, nitric acid, does not itself exist in the air any more than nitre itself. "It is probable that the spirit of nitre is a compound, and that some of its particles to which it owes its humid and grosser nature are derived from terrestrial matter; others dry and extremely subtle, agile, ethereal, and really igneous, these at any rate are certainly derived from air." The cautious reserve with which this statement is made was justified 100 years later when Cavendish showed that both kinds of particles existed in the air and could be made to unite by the passage of electric sparks through it.

The part of nitric acid which, according to Mayow's experiments, is certainly derived from air is nothing else than oxygen—"those igneo-aerial particles which are absolutely necessary for the production of flame; let me, therefore, henceforth call the fiery particles which occur also in air nitro-aerial particles or nitro-aerial spirit."

To account for the other component of nitric acid, the evidence justifies him in concluding that it may be present in what we should call organic matter in the soil, for which the chemists had provided him with no better term than "sulphur"; and the formation of nitric acid from this leads him to a remarkable discussion of the part played by oxygen in the formation of acids generally, instancing the conversion of iron sulphide by moist air into sulphate from which the acid spirit of vitriol can be obtained; this is also the work of the nitro-aerial particles of the air, "much as in the formation of rust or in the souring of ale or wine." In fact, if he had but given these particles a Greek name he would have called them oxygen, and for the same reasons as those for which Lavoisier introduced this word 100 years later.

ACIDS AND BASES.

A very important section, also on a purely chemical subject, the mutual affinities of acids and bases, comes later in the treatise (Chap. XIV., "of the heat of quicklime; incidentally of the combination of contrary salts"), and is a clearer exposition of the subject than had yet been given.

"Although acid salts and alkalies pass into a neutral substance when they meet yet they do not as is generally supposed entirely destroy each other. For example when the acid spirit of salt is coagulated with sal volatile (and the same is true of sal alkali) although the mixed salts seem to be destroyed, yet they may be separated again with their forces unimpaired. This happens when sal armoniac, or any volatile salt combined with an acid spirit, is distilled with salt of tartar (potassium carbonate). For then the whole of the acid in the sal armoniac will be coagulated with the fixed salt of tartar but the volatile salt of which it also in part consists will escape of the same nature as before. And the reason of this is that the acid spirit of salt is prone to enter into closer union with any fixed salt than it is with a volatile salt, so that it immediately leaves the volatile salts to combine more intimately with the fixed salt. If on the other hand oil of vitriol be united with salt of tartar they can scarcely be separated from one another, not because they have mutually destroyed one another but because there is nothing in nature with which either of them can unite more firmly than they do with each other." "As acid salts leave volatile salts to form a closer union with the fixed salt of tartar as with a more suitable spouse, so no doubt fixed salts select some one acid in preference to another that they may combine with it in a closer union.

The behaviour of nitre with oil of vitriol illustrates this.

"The acid salt of nitre will pass under a mild heat into the receiving vessel, whereas otherwise that spirit will not be carried up except by a very vehement fire. And this is so simply because the acid salt of nitre is volatile and the more fixed vitriolic acid thrusts it from its consort the sal alkali so that it is released from its ties and carried up under the action of no more heat than is necessary for the rectification of spirit of nitre whereas otherwise it can hardly be divorced from fixed salt unless it be by the most intense heat. The mass left in the retort closely resembles vitriolated tartar and can fitly be substituted for it."

More follows, as on the combination of metals with acids, on the sulphides of alkalis and metals, and on the theory of incompatibles, that is equally lucid because it rests on orderly experiment done with understanding. The application of the same ideas to the relation of quicklime to slaked lime and the carbonates fails; but nothing better was done with this for 80 years. The experiments are correctly carried out and observed, but without Black's fixed air and the differentiation of mild and caustic alkalis the explanation goes astray.

This work was published when Mayow was 34; he had taken his doctorate in law four years earlier; he was practising medicine at Bath through the summer; his real interest was the physiology of respiration; he apparently did not consider himself ready to take his doctorate of medicine, but he found time to bring order into the chemical thought of the day in the intervals of his other occupations.

Oxygen in Respiration.

The discovery of oxygen, by far the most important step yet taken in the history of chemistry, was of still greater interest in relation to the physiology of respiration. The experimental development of this is in the seventh and eighth chapters of the "de Sal Nitro."

When a mouse is placed under a bell jar that rests upon a wet bladder stretched over the mouth of a larger vessel the animal, as it breathes, removes from the air under the jar the component of the air that is taken up in its lungs, and the bladder bulges into the bell jar as the pressure is reduced in it, so that the larger vessel may be lifted bodily by lifting the bell jar. This is precisely similar to what happens when a flame has been burnt in a cupping-glass applied to the skin. Similarly, he describes in detail experiments in which he measures the amount of air consumed by a candle burning or by an animal breathing under a cupping-glass immersed in water. When the candle goes out and the levels have been duly adjusted, the water is found to occupy one-thirtieth of the space previously occupied by air, when the mouse dies one-fourteenth. In neither case is it possible to kindle in the air that is left combustible matter by means of a burning-glass, as can readily be done in fresh air.

These experiments could not have been done in Harvey's lifetime, because the conditions under which alone they could be done had not been defined by Boyle. Mayow carried them out with all precautions that could then be devised, and though they suffer from the defect that no account is taken of gaseous products of combustion or respiration, they open an entirely new chapter in the history of both chemistry and physiology. The alembic and crucible no longer constitute the entire armament of the chemist; there is something better for him to do than to go on for ever distilling off mercury from blood and urine.

"Clearly something in the air is absolutely necessary for life and enters the blood in respiration, for if the need for respiration were that the blood may be shaken up and divided into the minutest particles by the movement of the lungs the animal should not die so soon, for the air that is left should be able to do this perfectly well; and as it is subject to nearly the whole pressure of the atmosphere there is

no reason why it should not enter the expanded chest; for I have shown that it is the pressure of the atmosphere that causes it to do this."

"It is true," he continues, "the bluntness of our senses prevents us from seeing the passages by which the air enters the blood," just as it prevented Harvey from seeing those by which the blood passed from arteries to veins.

"They must be exceedingly short and minute for they merely have to pass through the membranes of the lungs; and they must be almost infinite in number. And yet in lungs that have been boiled and dissected an almost infinite number of perforations like the minutest points can be seen with the microscope. Whether they are the mouths of capillary tracheæ I cannot say.

"Animals and fire draw particles from the air so that it loses elastic force; that these particles are of the same kind in each case is established. If in a similar experiment to those previously described a lamp and a mouse are at the same time enclosed in a glass over water the lamp goes out first and the animal dies later. But the animal dies in about half the time that it would have been able to live had the lamp not been there. It is not suffocated by the smoke of the lamp for the same result is obtained if spirit of wine is used; moreover, I have tried to kindle with a burning-glass, in a vessel in which an animal had died from exhaustion of the air, combustible material previously hung in it. I had protected a part of the inside of the vessel from the condensed breath of the animal by a piece of paper which I could pull away by a string passing out below the mouth of the vessel. But it would not take fire. I shall not, however, make a final statement on this because the season being winter and the sky almost continuously covered with cloud I was not able to repeat the experiment."

"When the lamp goes out or the animal dies the remaining space is filled with air diminished in volume but able to resist the pressure of the surrounding air. I have indeed ascertained that such air is possessed of no less elastic force than any other air, for when the pressure of the atmosphere is removed it expands with no less vigour than common air."

Mayow published nothing after the five tracts. Four years later he was elected to the Royal Society on Hooke's nomination, left Oxford, and was married, and the following year he died in an apothecary's shop off Covent Garden, and was buried in St. Paul's Church there. He was 39. He was the youngest of the Oxford quartet and the first to die. The five tracts were translated into Dutch five years later, into German 125 years later in 1799, into French in 1840, and into English in 1907.

The only reference to his work for more than 100 years after his death appears to have been made by Stephen Hales. His work was forgotten. His discoveries rediscovered were the starting-point of modern chemistry. By that time men's minds had become ground in which the seed could germinate.

You will, I hope, think that in our commemoration it is fitting that he should be remembered in the twentieth century if only because he was so sadly forgotten in the eighteenth.

HOSPITAL WORK IN YORKSHIRE.—The area and scope of the Yorkshire voluntary hospitals' committee have been enlarged by the inclusion of most of the North Riding, and by the addition of delegates from hospitals and bodies not previously represented. The annual report of the committee states that "the fundamental consideration in this work has been that the maintenance costs of patients sent to any particular hospital should, as far as possible, be provided by the district from which they come." A subcommittee which has been considering the feasibility of creating a contributory scheme for the whole area has been unable to suggest a plan. At last week's meeting of the committee it was suggested that insurance companies should pay hospital expenses direct to the hospitals instead of to the victim of the accident. Last year motor accidents cost York county hospitals £1300, of which only £300 was recovered. The Hull area has now been organised by the formation of a voluntary hospitals' contributory council.

THE ACTION OF THE SERUM OF NORMAL INDIVIDUALS ON THE VIRUS OF POLIOMYELITIS.

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ACUTE anterior poliomyelitis is a disease to which young children are peculiarly susceptible. The comparative immunity of adults to this disease has never been definitely explained. Aycock (1928), as a result of a statistical survey of the age-distribution of measles, diphtheria, and poliomyelitis in urban and rural communities, found that the age-distribution of the three diseases was similar. In explanation of this phenomenon he conceived that the comparative immunity of the adults to poliomyelitis was to be attributed most probably to unrecognised attacks of the disease, as in the case of the other two diseases. This hypothesis has recently received support in America from actual examinations of the antiviral content of the serum of normal people by means of the neutralisation test in monkeys. This test, it may be mentioned, is the only one of general application for the study of immunity to this disease. The results here recorded confirm the statements that the sera of contacts, who have never had the slightest sign of the disease, may neutralise the poliomyelitis virus. It must be admitted that the number of cases examined is not great, but as one monkey is required for each test an investigation on a large scale, at least in this country, is not practicable. Consequently it is necessary to rely upon an accumulation of results from many small series such as this to establish the fact on a satisfactory basis.

The observation of Netter and Levaditi (1910) that the serum of convalescent poliomyelitis patients, after contact with the virus in vitro for a certain time, would inactivate the virus, has been confirmed repeatedly. On the strength of this finding the use of convalescent serum in the therapy of the disease has been definitely established (Davide, 1928; Macnamara, 1928; Aycock, Luther and Kramer, 1929). Netter and Levaditi (1910) later found that the serum of an abortive case had this neutralising property, while normal human serum (one sample tested) had no influence on the activity of the virus. Anderson and Frost (1911) also showed that serum from abortive cases possessed neutralising properties, and, moreover, found that several samples of serum from normal people contained antiviral bodies. Leake (1918) obtained evidence of the presence of neutralising bodies in the serum of one of three normal persons; this one positive case was a contact, the other two were not. Shaughnessy, Harmon, and Gordon (1930) have recently published some very interesting results. They found that the serum of normal infants under 2 years had little effect on the virus, while that of normal individuals over 2 years had, generally speaking, the same effect as convalescent serum on the virus of poliomyelitis. The largest series of observations on this question has also been recently recorded in America by Aycock and Kramer (1930). They examined 75 normal individuals and obtained neutralisation in about 50 per cent. of cases. The sera of urban persons

neutralised more frequently than those of rural, and, in both communities, the chance of neutralisation increased with age. Later they obtained similar results from an examination of a smaller series in a Southern State. Thus it seems that the serum of persons, who have never obviously suffered from poliomyelitis, may possess antiviral activity comparable, if not equal, to that found in convalescent serum.

The first indication that the serum of a normal individual might possess antiviral activity was obtained here some time ago when, in order to supply an extra control of the antiviral activity of several samples of convalescent serum, a sample of normal serum (R. W. F.) was also mixed with the test virus. The animal inoculated with the saline control became infected and died, while all the others remained well. An opportunity arose of continuing this study when in the course of last autumn a small outbreak of bulbar poliomyelitis occurred in a private boarding school at Sevenoaks.

TECHNIQUE.

The neutralisation test was adopted for the examination of the various samples of serum. In this test 0·6 c.cm. of the various samples of serum was mixed with 0·4 c.cm. of a 5 per cent. virus emulsion; after contact at 37° C. for 1½–2 hours and overnight at 4° C. the mixture was agitated and 0·5 c.cm. inoculated intracerebrally into a *M. rhesus* under ether anæsthesia. The test virus in all cases was very potent, the dose employed in the test containing at least 100 minimal infecting doses. Its activity has been discussed in more detail elsewhere (Fairbrother, 1930). In all cases a saline control was employed.

Results.

Some time after the attack had occurred in the school (about six months), samples of serum were obtained from various pupils—convalescent and abortive cases, close and remote contacts. The abortive case, E., was the first observed in the epidemic, and had a high temperature, with marked pharyngitis, but without any obvious nervous involvement. In one instance three samples of convalescent serum were pooled, otherwise each sample was tested separately. The activity of the virus was controlled by mixing the virus with saline in the same proportions as in the case of the serum. The results of the experiment are given in Table I.

TABLE I.

Serum.	Nature of case.	Result.
A .. .. 13 yrs.	Convalescent.	0
B, C, D pooled 11, 9, 7 ,,	,,	0
E .. .. 9 ,,	Abortive.	0
F .. .. 8 ,,	Brother of B (Close contacts.)	0
G .. .. 13 ,,	,, A (Close contacts.)	0
H .. .. 10 ,,	Contacts (Remote.)	0
I .. .. 8 ,,	,, (Remote.)	0
—	Saline control.	+ (5 days)

Key: 0 = no infection. + = infection (with the incubation period).

The findings were similar to those obtained by the American workers. The control animal became infected after an incubation period of five days, while all the other animals remained quite well, thus indicating that the serum in all cases contained antiviral bodies. A degree of immunity was found to be present in contacts who had never had the slightest sign of poliomyelitis, but whether this immunity was the result of contact with definite cases in this outbreak or had been acquired at some previous period could not be decided. The former explanation seems the more probable. Owing to shortage of monkeys it was not possible to compare the degree of protection afforded by the sera of the contacts and the convalescents.

It was considered important to perform similar tests with the sera of children who had never, so far as one could ascertain, been in the vicinity of a case of poliomyelitis. Unfortunately this could be carried out only on a very limited scale. The serum of two pupils who arrived at the school after the outbreak had settled down, and one infant,* 3 months old, living in the East End of London, were examined. The results are given in Table II.

TABLE II.

Serum.	Result.
J (9 years)	0
K (7 years)	+ (5 days)
L (3 months)	+ (11 days)
− (saline control)	+ (6 days)

Evidence of the presence of antiviral bodies was obtained from one sample of serum. In the case of the other two, one animal became infected after a slight prolongation of the incubation period; this might have been due to the remains in the serum of antiviral bodies passively transmitted from the mother as the case was a young infant (Aycock and Kramer). Little of value can be obtained from this table. It indicates, however, that antiviral bodies are not found in every sample of serum, and also that persons who have never been in contact with a case of poliomyelitis may possess some degree of immunity against this disease.

Conclusion.

Immunity to the poliomyelitis virus, as indicated by the presence of antiviral bodies in the serum, is frequently present in normal people who have been in contact with definite cases of the disease without developing it. The results recorded here support Aycock's view that the observed immunity of adults to poliomyelitis is most probably due to "subclinical" infections.

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* This serum was obtained by the kindness of Dr. Temple Grey.

DEWSBURY INFIRMARY.—This new hospital was estimated to cost £98,000; it is now officially stated that a total expenditure of £150,000 will be necessary. Several extra departments have been added to the original scheme, and many improvements have been made structurally and to minimise the cost of maintenance. The main block has cost £1100 per bed, which the architect, Mr. T. W. Sharpe, thinks is "not excessive." A further £26,000 is required.

LYMPHANGIOMA OF THE ABDOMEN.

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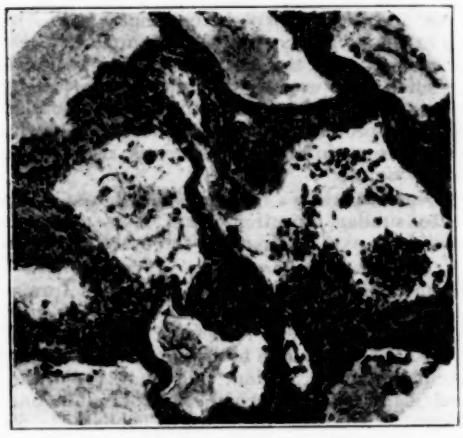
A LYMPHANGIOMA is an organised neoplasm of endothelial-lined vessels and the supporting tissues which go to make up the lymphatic system. All these structures are involved in the overgrowth. Distinction must be made between lymphangioma with new tissue formation and lymphangiectasis with dilatation of pre-existing structures.

Perhaps the most interesting lymphangiomas are those arising within the abdomen, where they occur in the mesentery or omentum, or retroperitoneally. They may be found in children or adults as multilocular, cavernous, or cystic tumours which do not affect the receptaculum chyli or thoracic duct, and are almost certainly of congenital origin, arising from developmental disturbance or misplaced islands of lymphatic anlage. Such islands have been demonstrated in the omentum and mesentery of new-born pigs by Ranvier.[1]

FIG. 1.



Section of main tumour showing endothelial-lined channels.

FIG. 2.

Another section showing the channels and a lymph node.

A more complete knowledge of the embryology and physiology of lymphatics will possibly enable the pathogenesis of these tumours to be traced in detail. According to Fisher[2] about 50 cases have been recorded in which the mesentery or omentum has been involved. Half of these are not true neoplasms but cases of lymphangiectasis and inflammatory hyperplasia. On the other hand, failure to appreciate the inclusion in lymphangioma of all tissue elements which take part in the formation of the lymphatic system has led to the inclusion under other headings of tumours which are almost certainly lymphatic. It does not seem correct, moreover, to exclude from the total all those cases in which symptoms have first occurred in adult life. Other tumours of known embryological origin lie dormant until childhood has passed. Comparatively few of the recorded cases occur in British literature, that of Spencer Wells in 1890 being, perhaps, the first.[3]

Record of a Case.

A boy, aged 8 years, was admitted with the history that two days before he had been "butted in the stomach" by a boy at school, and had that night complained of severe abdominal pain. He had vomited twice. The bowels were well open three hours before admission. The parents had noticed that he had always had a "big stomach," but he could run and play normally, though there were occasional "bilious attacks," with colic.

The child was thin, lying on his left side with his knees drawn up and crying with pain. He refused to lie on his back or to straighten his legs. The abdomen was distended and tense; there was general resistance but no absolute rigidity. The lower costal angle was widened. The percussion note was dull over the centre of the abdomen, and extended to the flanks and both iliac fossæ; the liver dullness was diminished. The temperature was 99·3° F., the pulse-rate 120, and the respiration-rate 28.

Mr. Morgan Jones opened the abdomen by a mid-line incision. A large cyst with injected walls was found apparently attached to the region of the duodeno-jejunal flexure. It could not be freed, and was packed round and opened. About four pints of odourless brownish fluid escaped. The cyst wall appeared to be about 2 mm. thick, and of a fibromuscular structure. It was thicker at the base and had necrotic-looking material attached to it. Round the base were three small thin-walled cysts containing clear fluid. Most of the cyst wall was removed, but the base was attached to a firm retroperitoneal mass about 2·5 by 5 cm., the upper and lower edges of which could not be clearly defined. The patient became collapsed, and the abdomen was closed, after inserting a drainage-tube to the pelvis.

The child appeared to make a good recovery, but three weeks later commenced to vomit, with attacks of colicky pain and distension of the abdomen. The temperature was 102° F., and the pulse-rate 86. The old incision was reopened and free serous fluid evacuated. A mass was found attached to the posterior abdominal wall slightly to the left of the mid-line, extending between the second and fourth lumbar vertebræ. It resembled a fibroid uterus in colour and consistency. On incision it was fairly firm and not hæmorrhagic. No abscess was found. The mass was considered to be sarcomatous, and the abdomen was closed. After a temporary improvement the condition steadily became worse; the lower part of the wound broke down, and the boy died four weeks after the second operation.

POST-MORTEM EXAMINATION.

The body was markedly emaciated. The abdomen was scaphoid, with a mid-line scar healed in its upper portion, but opening lower down into a large cavity in the pelvis, 3 cm. in diameter by 4 cm. deep, covered with granulation tissue. Post mortem lividity was absent; there was an anterior staphyloma of the left eye. On opening the abdomen, multiple thick adhesions were exposed and a pocket of pus was found in each iliac fossa. All the small intestine was on the right side and shut off by omentum. There were more adhesions round the liver, behind which was an intraperitoneal subphrenic abscess. Commencing opposite the second lumbar vertebra, to the left of the mid-line, was a smooth-surfaced tumour lying in the retroperitoneal fascia. It was about 1 cm. by 0·5 cm. in size, at the upper end, increasing to about 3·5 cm. by 2·5 cm. at the lower end as it merged into the mass of inflammatory tissue in the pelvis opposite the fifth lumbar vertebra. The

peritoneum stripped from the tumour, but the latter could not be shelled out from the fascia behind. The upper end was connected to ten strands running up in the loose tissue to the cœliac region. On incising the tumour, the cross section resembled corpora cavernosa. No macroscopical cysts were seen in the tumour or omentum. The mesenteric lymph glands were normal.

MICROSCOPICAL EXAMINATION.

1. Cyst wall: section shows a fibromuscular structure, covered on the outside by peritoneum, and with the inner lining mostly destroyed, though here and there are a few flattened cells. There are numerous lymphatics and blood-vessels in the wall, and plain muscle-fibres form an incomplete layer in the fibrous tissue. The whole section shows inflammatory reaction.

2. Transverse sections of the tumour: the sections show fibrous tissue of varying density containing numerous spaces lined by flattened cells. In some areas these spaces are so numerous that only a single layer of the flattened cells separates the cavities; in others there is proliferation of the flattened cells, which may show as many as three or four layers. For the most part these channels are cut transversely, but occasionally one is seen in longitudinal section. In the regions of greatest activity—i.e., where the channels are most numerous—solid nodes of cells are seen, with a small clear space extending partly round them and separating them from a surrounding ring of flattened cells. In these nodes are many round cells, some polymorphonuclear leucocytes, and distinguishable behind these are large paler cells with large, light-staining nuclei, resembling the reticular cells of the spleen. All the sections, particularly those from the caudal end of the tumour, show inflammatory reaction. The sections are typical of lymphangioma with inflammatory changes.

Diagnosis.

Diagnosis is a matter of difficulty. Abdominal lymphangiomas only cause symptoms when they produce obstruction in surrounding organs or become cystic. Obstruction from uncomplicated lymphangioma must be rare—no recorded cases were found—and in the cystic condition the enlarging abdomen may be the only symptom unless trauma, infection, or torsion bring about acute changes.

Hearn,[4] Arzela,[5] Brandt,[6] and Stillman[7] have made pre-operative diagnoses of omental cyst. The most common provisional diagnoses are tubercular peritonitis, ovarian cyst, and retroperitoneal sarcoma. A large cyst arising from behind the intestines is responsible for the resemblance to ascites. Encysted fluid may sometimes be differentiated by comparison of the percussion notes in the vertical and Trendelenburg positions. In the case recorded, attention is drawn to the refusal of the child to lie on the right side, in view of the attachment of the tumour to the left of the mid-line.

Differentiation of the mesenteric cysts is not easy even at operation. They are mostly of congenital origin, and may be classified as follows [8]:—

- Congenital
  - Simple
    - Serous.
    - Chylous.
    - Irregular occulsion of Meckel's diverticulum.
  - Neoplastic
    - Ectodermal—epidermoid.
    - Mesodermal
      - Lymphatic
        - Lymphangioma.
        - Chylangioma.
      - Wolffian.
    - Enterodermal
    - Teratoma from fœtal inclusion.
- Congenital cysts (simple or neoplastic) complicated by intracystic hæmorrhage.
- Acquired
  - Pseudocysts
    - Hæmorrhagic.
    - Inflammatory.
  - True
    - Parasitic.
    - Malignant.
    - Gaseous.

Microscopical section will determine the nature of the cyst if the lining membrane is present, but not infrequently in the larger cysts it is destroyed, and in the pseudocysts there is no lining. The remainder of the cyst wall is scarcely sufficient on which to base a diagnosis. Plain muscle may occur in enterogenous, lymphangiomatous, chylous, and Wolffian cysts. Dilated and increased lymph-vessels are present in the walls of the lymphatic cysts—possibly due to the cyst arising from within the tumour mass—and have a flat endothelial lining. In large cysts, or where inflammation or hæmorrhage has occurred, the lining may be destroyed.

Pathogenesis.

Many theories have been put forward to explain the origin of cystic lymphangioma of the abdomen.

(*a*) *Stasis and retention in normally formed lymphatics.*—This is probably the ætiology of many of the recorded cases of lymphatic cyst of the mesentery, but it is dilatation, not new growth. Fisher considered his case to be due to inflammatory changes in the lymphatics following an attack of tonsillitis several years previously. Outerbridge [9] regarded the majority of lymphatic cysts of the omentum as of this nature. In his own case the cysts occurred in an omentum attached to a large uterine tumour. He investigated the anatomical arrangement of the omental lymphatics and concluded that such adhesions would cause complete lymphatic obstruction. This may be adduced to explain lymphatic cysts, but it seems excessive to say that the inflammatory changes are responsible for the actively growing lymphangio-endothelial structure of which the cysts form part. Moreover, why should obstruction in peritoneal lymphatics produce cysts without œdema, whereas elsewhere—e.g., in filariasis—it gives rise to œdema pure and simple?

(*b*) *Degeneration in a lymphatic gland.*—This is open to similar objections, and it is anatomically impossible to explain many of the cysts on this basis.

(*c*) *Congenital malformations of lymphatics.*—This is the most strongly supported theory of formation, but there is considerable dispute as to the stage of development at which it occurs. Arzela considers that the condition is due to an error in the early stages of lymph-gland formation, and that the cysts are dilated gland walls in which the reticulum has not developed. Others, including Ribbert,[10] Sick,[11] Henchen,[12] and Ewing,[1] believe that their origin is from primary lymphatic anlage. The abdominal lymphatic system arises mainly from the retroperitoneal primary lymph sac.[13] This, by division and outgrowth, forms the lymph glands and ducts, both retroperitoneal and mesenteric. It is capable, therefore, of forming all the elements of the lymphatic system. Uncontrolled hyperplasia of an occluded portion of this tissue, then, would produce a tumour containing all those elements in an actively growing state.

The case reported here provides an excellent example of this state. All stages are present, from completely formed lymphatics and cysts containing plain muscle-fibres in their walls to actively growing endothelial rods opening out later into channels and nodes consisting of basic reticular structure which are possibly incompletely-formed lymph glands. The ducts running from the neoplasm towards the cœliac region may be an attempt on the part of the tumour to coördinate itself with the normal lymphatic system.

The problem of the origin of cysts in these tumours involves that of the formation of lymph—i.e., whether the endothelial cells actively secrete or passively conduct, or do both. Experimental physiology has failed to show that they do more than act as a filtering membrane of variable permeability,[14] but the pressure against which the cysts are formed is greater than that of the tissue fluids. The intra-abdominal pressure becomes increased, and finally

the muscular wall is stretched. This means that work has been done and fluid formed against increasing tension. In the pathological state, at least, endothelial cells probably secrete.[15]

An accurate analysis of the cyst contents and comparison with normal lymph might help in the elucidation of the problem. Unfortunately, the contents in this case were not analysed, but Grausman and Jaffe [16] state that they contain a high percentage of globulin and albumin, but no mucin.

I am indebted to Mr. Morgan Jones, of the St. Albans and Mid-Herts Hospital, for permission to publish this case; to Lieut.-Colonel W. F. Harvey of the Royal College of Physicians Laboratories, Edinburgh, for help with the microscopical sections; and to Mr. T. Hamilton for the microphotographs.

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ACHLORHYDRIA AND ANÆMIA IN ADVANCING YEARS.

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SINCE it was demonstrated that the healthy gastric mucous membrane contains some specific substance which has the property of inciting a remission in pernicious anæmia,[1] further interest has been aroused in the relationship of achlorhydria to anæmia. Many investigators have described the presence of a secondary anæmia in association with achlorhydria, and some have recorded encouraging results with liver therapy. Faber,[2] whose work on achlorhydria is well known, has advocated the administration of large doses of iron in cases of "essential achylia," and Kohn [3] has also drawn attention to the frequency of blood changes in benign achlorhydria. The mechanism of the production of anæmia, whether primary or secondary, in these cases of achlorhydria is still unsolved, but it is fairly certain that the achlorhydria is the basic condition and that the primary change is this derangement in gastric function. A recent paper by Borgbjaerg and Lottrup [4] deals with the blood picture in a series of cases showing achlorhydria; they found that 50 per cent. of the patients showed some degree of anæmia, with the colour-index above 1 in 22 per cent. and megalocytosis in 15 per cent. The constancy of achlorhydria in pernicious anæmia is such that the finding of hydrochloric acid in the gastric juice either proves the diagnosis to be erroneous or makes the case one of extreme rarity and interest; the converse, however, does not hold. While Hurst [5] has supported the views of Martius [6] that the achlorhydria has a constitutional or congenital origin, Faber [7] and others believe that it results from pathological conditions, suggesting that, as the liver or kidney can be damaged by a blood-borne toxæmia, so can the gastric mucous membrane. Faber points out that febrile states in children often produce an achlorhydria, which may be either transient or long or permanent. If it is correct to regard achlorhydria as an index of a derangement of gastric function resulting from disease, a greater frequency should be expected with advancing years; if this achlorhydria plays any part in the development of anæmia a series of cases in the latter decades of life should show such changes.

To test these views a hundred persons over 60 years of age and in normal health were selected and their response to the ordinary fractional gastric analysis recorded. Their ages varied between 60 and 95; 47 were males and 53 were females. A more detailed account of the cases and our observations on them are to be given elsewhere,[8] but the salient features are here set out. None of the patients had suffered from digestive ill-health. Arterial sclerosis was found in all to a varying degree, and the systolic blood pressure ranged between 120 and 250 mm. of mercury, with no apparent relation to the gastric secretion. The blood was examined in all cases showing achlorhydria, and the results were compared as a series with those of the group showing an abundant secretion of free hydrochloric acid. The condition of the tongue was also noted, whether rough and papillated, or smooth and glazed.

Results of the Investigation.

The 100 cases examined can be divided into the usual four groups in respect to acid secretion:—

	Per cent.
(*a*) Achlorhydria	32
(*b*) Low secretion of hydrochloric acid— Values less than 10 c.cm. N/10 NaOH	12
(*c*) Normal secretion of acid— Values between 10 and 50 c.cm. N/10 NaOH	43
(*d*) High secretion of acid— Values above 50 c.cm. N/10 NaOH	13

The most striking departure from normal is the high frequency of achlorhydria—32 per cent. of all cases. A common finding was a definite delay in gastric secretion during the first one-and-a-half-hour period of the test-meal; this may have been due to psychical inhibition resulting from the analysis, for none of the cases had had such an experience before. Another point noted was the frequency with which unchanged gruel was aspirated in the samples of juice, both in the acid and in the anacid cases.

(*a*) *The Achlorhydria Group.*—Thirty-two patients showed complete absence of hydrochloric acid with the ordinary fractional analysis. Of these, 12 were males and 20 females. In 15 there was some degree of pallor, and in seven the tongue surface was smooth and glazed. In none was there any other abnormality to suggest an ulcerative lesion. A rapid emptying-rate was common in this group, the majority of the stomachs being empty in two hours. Twenty-seven of these cases were submitted to histamine stimulation a few days after the ordinary gastric analysis. An average dose of 0·5 mg. was injected subcutaneously after the withdrawal of the resting juice and samples of juice were aspirated 15 minutes and 30 minutes later. No ill-effects were observed. The subsequent

examination differentiated these cases into two groups:—

1. Achlorhydria with hydrochloric acid secretion after the injection of histamine—*apparent achlorhydria*—13 cases—10 female and 3 male.

2. Achlorhydria persistent after the injection of histamin—*true achlorhydria*—14 cases—7 males and 7 females.

Apparent Achlorhydria.—The height of hydrochloric acid recorded was roughly parallel with the volume of juice secreted. The gastric ferment—pepsin—was also estimated in some of the cases. No parallel relationship was found between the acid secretion and the pepsin content of the secretion; some cases showed a high secretion of pepsin with little hydrochloric acid, and some with a good secretion of acid gave comparatively low pepsin values. The blood counts in this group showed only one case in which the red cell count was below 4 million, while the hæmoglobin was below 60 per cent. in three cases.

True Achlorhydria.—No hydrochloric acid secretion followed the subcutaneous injection of histamine. Four of the cases possessed glazed tongue surfaces and seven showed red cell counts between 3 and 4 million; in four of these the hæmoglobin was 60 per cent. or below. In three cases the blood films showed macrocytes, the large forms being well filled with hæmoglobin and more oval than circular. The estimation of pepsin in this group showed that histamine stimulates the secretion of pepsin as well as of hydrochloric acid and, in this particular group, in the absence of hydrochloric acid. The two cases showing the lowest ferment content also showed red cell counts below 4 million. In no case was pepsin completely absent. A series of 100 persons over the age of 60 need not of necessity, therefore, contain any case of true achylia.

Of the 32 cases showing achlorhydria by the ordinary method of analysis, five were not investigated with histamine for various reasons. In two of these the tongue was smooth, and in two the blood figures showed some deficiency in hæmoglobin.

Group B, showing a normal secretion, and *Group C*, showing a low secretion of hydrochloric acid, furnish no information.

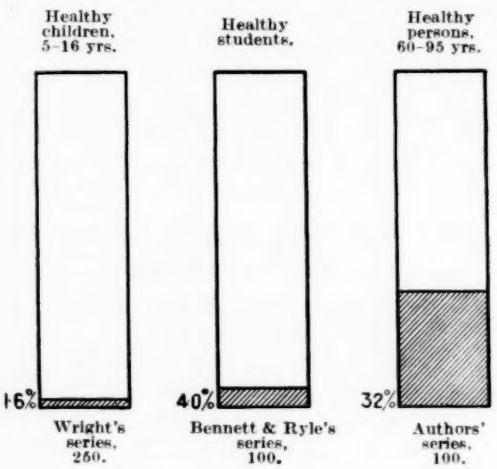
Group D, High Secretion of Hydrochloric Acid.—Thirteen cases belong to this class, showing a hydrochloric acid value of above 50 c.cm. N/10 NaOH at some part of the analysis. All the cases were free of symptoms and in none was the tongue smooth.

Discussion.

Achlorhydria and Carcinoma of the Stomach.—The frequency of achlorhydria in carcinoma of the stomach is undisputed, and it has become an important diagnostic finding in a man with a short history of indigestion. While there is no doubt of the truth of this relationship, its importance as a sign is somewhat lessened in view of our finding: that 32 out of 100 apparently healthy persons over the age of 60 show achlorhydria.

Achlorhydria and Age.—Stimulated by the researches of Faber, many investigators have studied the gastric secretion in infants and children and, despite the great difficulties in obtaining samples of juice, sufficient data have been accumulated to show that, while achlorhydria is common during and after a febrile illness, it is extremely uncommon in healthy children. Perhaps the most significant work in this line is that of Wright,[9] who studied the gastric secretion in 250 children between the ages of 6 and 15 years and found hydrochloric acid in all but four—an incidence of 1·6 per cent. The researches of the workers in the Copenhagen Pædiatric Clinic[10] have also demonstrated the rarity of achlorhydria in children. Hertz, Chievitz, and Andersen's series of 127 healthy children showed no cases without acid secretion. The standard series of 100 healthy students studied by Bennett and Ryle[11] showed four with no free hydrochloric acid secretion. Unfortunately previous work on the gastric secretion in the later decades of life has been conducted on the Ewald method of analysis; as a large number of our cases showed a definite delay in secretion, it is not surprising that Dedichen[12] should have found achlorhydria in 66 cases out of a series of 99 which he examined by the one-hour method. Comparing our results with the work of Wright in childhood and with those of Bennett and Ryle on students, we obtain a striking difference, which is shown diagrammatically in the Figure.

It appears, therefore, that there is an increasing incidence of achlorhydria with advancing years, and



that this indicates a progressive loss of function in the gastric mucous membrane. That this loss of function is only partial is shown by the ability of the stomach to secrete acid under histamine stimulation in almost half of these cases; and also by the presence of pepsin in varying amounts in all cases. The hydrochloric secretion seems the first to fail, and is probably more susceptible to outside factors than pepsin secretion.

Achlorhydria and Anæmia.—This is an interesting relationship, especially in view of the recent work of W. B. Castle[13] on the power of healthy gastric juice to produce a remission in pernicious anæmia by its action on beef muscle. That the gastric juice is able to produce the change on beef muscle in neutral solution[14] is another point of significance, for this may furnish an explanation why achlorhydria is not always associated with anæmia. Until we know more about the nature of this substance in the gastric juice we shall be unable to differentiate cases where achlorhydria is of no material importance from those in which its sequel will be anæmia. In our cases, although there are no marked blood changes, those showing no hydrochloric acid secretion after histamine show the bigger departure, for in seven of the 14 cases the red cell counts were between 3 and 4 million, while in that group of 13 which showed hydrochloric acid after histamine injection the red cell count was below 4 million in only one; and in that group possessing an abundance of hydrochloric acid secretion

normal blood figures were obtained in all but one case with a red cell count of 4·3 million and a hæmoglobin percentage of 62. In none of the cases could the gastric secretion be termed an achylia, yet two of the true achlorhydria group showing red cell counts below 4 million were poor in pepsin secretion. The reverse was seen in one case which showed no anæmia and yet a small secretion of pepsin. Although the pallor of many of the cases made us anticipate greater departures from normal in the blood picture, it can be concluded that the changes observed occurred more frequently in the group of true achlorhydria than in the other groups. While a relationship between pepsin secretion and anæmia is suggestive, further work is necessary before a conclusive opinion can be expressed. It must be remembered, however, that not only is there an achlorhydria in pernicious anæmia but the condition is a true achylia, and in none of our cases was such an advanced deficiency found. This may account for the indeterminate blood changes we have encountered. It is a matter of conjecture whether, if the cases of true achlorhydria had developed their gastric defect earlier in life, they would have ultimately become cases of frank pernicious anæmia. Their subsequent course may throw light on this problem.

Achlorhydria and Atrophic Changes in the Mucous Membrane of the Tongue.—It is well known that changes in the mucous membrane of the tongue are found in pernicious anæmia and that soreness of the tongue is often one of the symptoms, sometimes the earliest observed by the patient. Atrophic changes are also seen in women in that condition called "dysphagia and anæmia" in which the atrophic changes are continued down the pharynx and œsophagus. Achlorhydria has also been found in this condition in some of the few cases examined.

Of the 68 cases in our series which showed some secretion of acid, a smooth tongue was only found in two, but it was present in seven of the 32 showing achlorhydria. Of the seven cases showing atrophic changes in the tongue four were in the true achlorhydria group, two in the incompletely investigated group of five cases, and one in the apparent achlorhydria group. A smooth tongue is therefore found more often in cases showing a deficient gastric secretion than in cases with a normal secretion; this emphasises the fact that atrophy of the mucous membrane of the tongue and an abnormal or deficient gastric secretion may occur together.

Conclusions.

1. There is a higher incidence of achlorhydria in the later decades of life.

2. The fact that achlorhydria is found in 32 per cent. of healthy persons over 60 minimises its diagnostic value in carcinoma of the stomach.

3. True achlorhydria can be distinguished from apparent achlorhydria by the administration of histamine. The percentage of true achlorhydria is about 15.

4. A slight degree of anæmia is found more frequently in cases showing a true achlorhydria than in those showing a normal acid secretion.

5. Anæmia is more common in cases showing a diminished pepsin secretion than in those showing a good secretion of pepsin.

6. Atrophic changes in the mucous membrane of the tongue are more frequently associated with true achlorhydria than with a normal gastric secretion.

It is with pleasure that we record our thanks to Dr. W. E. Turner, medical superintendent, Park Royal Hospital, for granting us freedom to investigate all the cases herein referred to. We also wish to acknowledge our gratitude to Prof. E. C. Dodds for his encouragement and criticism.

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OBSERVATIONS ON DISSEMINATED SCLEROSIS.

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THE following is a preliminary communication upon 12 cases of disseminated sclerosis with reference to the cultivation of *Spherula insularis* and specific vaccine treatment.

In the interests of 24 long-standing cases at present under treatment at the Manor Hill Red Cross Hospital, Birkenhead, we decided to investigate the cerebro-spinal fluid by the method of cultivation employed by Miss Kathleen Chevassut, as described by her in THE LANCET (1930, i., 552). Our hospital committee, having sanctioned the purchase of the somewhat expensive special equipment necessary, the following procedure was adopted. The results of examination of the cerebro-spinal fluid in all 12 cases is set out in the Table.

*Table giving Results of Examination of Cerebro-spinal Fluid in 12 Cases.**

Ref. No.	Lange gold curve.	Cells.	Globulin.	Total protein (mg.%).	Ref. No.	Lange gold curve.	Cells.	Globulin.	Total protein (mg.%).
35	5555551100	6	+	140	26	4432220000	8	Trace	95
30	5555430000	8	++	95	25	4433432100	12	++	100
23	5554342000	10	+	95	21	3112210000	6	Trace	80
24	5544432200	12	+	80	31	1533333300	10	+	60
33	5543442100	2	++	200	34	1223321000	2	Trace	60
66	4443222000	4	+	60	22	2222320000	5	Trace	90

* In each case the Wassermann reaction to the C.S.F. and the blood was negative.

It is important to note that these 12 cases had previously received a varying number of courses of intravenous silver salvarsan, and although in four of these the gold curve is now low there still remain pathological changes in the cerebro-spinal fluid of all examined.

Adopting the method of culture as described by Miss Chevassut with equipment similar to that in use by her at the present time, we found that 11 out of 12 cases showed spheres and granules indistinguishable from those seen at the neurological research laboratory at Westminster Hospital when visited

by us. The one case (No. 22) showing no spheres has a low gold curve, and his clinical condition has been stationary for a considerable time. A further confirmation of some of our cultures was made by Miss Chevassut on her visit to our laboratory.

We have so far been able to show that by using Hartley's serum agar pH 7·6 colonies and free spheres, with and without granules, can be seen on the slip preparations, using dark-ground illumination and suitable magnification and that the "growth" of spheres vary in numbers and rapidity of multiplication in the different cases, the media employed being of one preparation. Using Hartley's serum broth pH 7·6 similar spheres and granules have been seen. The macroscopic appearances of the inoculated broth showed in some tubes an opalescence while others remained clear. In two tubes a turbidity was observed, which later settled to the bottom of the tubes. Subcultures on blood-agar and serum broth in all cases have been made to determine whether a non-filter-passing organism was present. All such cultures remained sterile, except in one of our first cases when *Staphylococcus albus* was obtained. In this case the staphylococci were removed from the broth by filtration through a Berkefeld filter, the filtrate showing free spheres which increased in numbers after 48 and 72 hours' incubation. Attempts have been made to stain the spheres present in both cultures, but so far without success. Controls used consist of (*a*) uninoculated media (containing serum) identical with that used for cultivation purposes, and (*b*) the cerebro-spinal fluids from four cases of tabes dorsalis. These fluids were taken at the same time as the fluids from the cases of disseminated sclerosis and dealt with in exactly the same manner. None of the controls showed the presence of the spheres.

In the initial stages of this work many difficulties have been encountered, mainly due to defects in the preliminary apparatus and in avoiding contamination. Since the one case of contaminated cerebro-spinal fluid stricter aseptic precautions have been observed by the operator, dry sterile gloves being worn after the preliminary preparation of the hands, and the patient's skin has been prepared as for a surgical operation.

So far 11 autogenous vaccines have been prepared, and are being administered intravenously. The cerebro-spinal fluid from all cases treated with vaccines will be examined periodically and results published combined with clinical details in each case. It is not to be expected that marked improvement in physical signs will be found in old-standing cases like the foregoing, but the importance of changes in the pathological findings in the cerebro-spinal fluid after treatment by the autogenous vaccines would be obviously great. A further series of cases is being investigated and we hope to include others of recent origin, or cases in which the progress of the disease is not advanced.

Summary of Observations.

The noteworthy features of our observations are: (1) the variation in the rate of growth of the spheres in the fluid and solid media; (2) the characteristic grouping as if in colony formation; (3) the degree of alteration or apparent degeneration of older spheres; (4) the formation of extra-spherular granules in various numbers; (5) the case showing no growth in the C.S.F., and which was stationary from a clinical point of view; (6) the fact that the controls so far investigated show no growth of spheres.

The above observations and the fact that such findings in this limited series are strictly comparable with the original observations published and were not observed in the controls strongly suggest the presence of a living filter-passing virus in the cerebro-spinal fluid of cases of disseminated sclerosis.

We are greatly indebted to Sir James Purves-Stewart, and Miss Chevassut for so freely answering questions as to the apparatus employed in the cultivation of the cerebro-spinal fluid, and the clinical application of what appears to be the specific virus of disseminated sclerosis.

CLINICAL AND LABORATORY NOTES

TREATMENT OF THE SIMPLE GANGLION BY INJECTIONS.

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THE simple ganglion is of interest from many points of view. The pathology is not definitely known, but the commonest opinion is that it is formed by cystic degeneration of connective tissue in the region of the joints.

Ganglia predominate in the female sex in the second and third decade, and in those of slight build. They may disappear spontaneously or on giving up a particular form of exercise, such as riding. Three chief methods have been employed in the treatment—namely, subcutaneous rupture, excision, and injections.

THREE METHODS.

(1) *Subcutaneous rupture* is brought about by pressure exerted by the thumb, or much more commonly by a sharp knock with a book. The thick mucinous fluid diffuses into the surrounding tissues and is absorbed in a few days. There is no doubt that a cure may follow, but recurrence is frequent (probably in about 50 per cent. of cases). The traumatic inflammation following this method probably accounts for its superiority over simple aspiration or incising the ganglion with a tenotomy knife.

(2) *Excision* of a ganglion is regarded as a minor operation. This is wrong, and accounts for the recurrences after operation. Careful and complete excision of a ganglion is almost certain to result in a cure. The operation may prove tedious and difficult, one or more tendons may be exposed, and there may be an opening into the joint. Complete hæmostasis and asepsis are necessary, as any infection following the operation might have serious consequences.

(3) The *injection* treatment of ganglia is of long standing. Many substances have been used, but the chief have been iodine and carbolic acid. These substances may cause much pain, and are not free from the danger of subsequent sloughing.

TECHNIQUE OF INJECTION.

During the last year I have treated many ganglia by injections of sodium morrhuate, and the results have been extremely satisfactory. The skin over the ganglion is carefully sterilised. A small quantity of local anæsthetic is injected into the skin at the side of the ganglion with a fine needle. A needle of moderate bore is inserted at this point, and the contents of the ganglion are aspirated. At times the contents are so gelatinous that they can be expressed through the needle only by firm pressure over the ganglion. With the needle still in the

ganglion, 5 per cent. sodium morrhuate is injected. The quantity will vary with the size of the ganglion, from 0·5 to 2·0 c.cm. After the injection the ganglion swells and may reach its former size and tenseness. There is mild pain for a day or two. If the quantity of sodium morrhuate is correctly judged, the ganglion only reaches about half its original size, the pain is slight, and there is no redness. After a few days the ganglion diminishes in size and quickly disappears. If the ganglion is still present at the end of two weeks it is again aspirated and injected, the quantity of sodium morrhuate being increased. If it is thought that the ganglion communicates with a joint the patient is instructed to keep the limb at rest for a few hours following the injection. No joint pains have followed the injections, and there have been no complications.

Recently ten cases have been examined in which treatment has been completed at least four months. The ganglia had disappeared in all but two. In these two a nodule a little bigger than a pea remained, and in both the quantity of sodium morrhuate used had been less than 1 c.cm. In both of these the ganglia had been the size of a walnut, and the quantity injected should have been 1·0 to 1·5 c.cm.

As the symptoms caused by ganglia are not severe, and as the treatment is undertaken partly for cosmetic reasons, operative treatment is only indicated when simpler methods have failed. Treatment by injecting sodium morrhuate offers good prospects of a cure without the danger of complications.

A CASE OF
PARAPLEGIA IN HODGKIN'S DISEASE.

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A RAILWAY porter, aged 23, came to the out-patients' department of University College Hospital on May 16th, 1929, for pain in the back and stiffness. There was no deformity. The first examination suggested spinal caries, but no lesion was detected by radiography. A week later he was admitted, and by this time there was weakness with difficulty in walking. On inquiry it was ascertained that he had suffered for five months from intermittent gripping pains in the chest, usually caused by exertion. There were night sweats. For two months there had been dull aching pains across the back and shoulders. For two weeks tender lumps had developed on the skull, and with these headache. There had been a history of enlarged glands in the neck three years before, and a year previously he had injured his back by a fall.

On admission the physical signs were as follows. There were some large lymphatic glands on both sides of the neck and a few in the left axilla. Two hard tender swellings were present on the skull, one over the right side of the forehead and one over the right temporo-parietal region. There was a partial paraplegia from the level of the tenth dorsal vertebra. Nothing abnormal was found in the heart, lungs, or abdomen. The temperature was 103° F., the pulse-rate 116, and the respirations 22 to the minute. A slight general pallor was present. The blood showed a secondary anæmia. The Wassermann reaction, both of the blood and spinal fluid, was negative. The urine was normal. Radiography proved of no assistance.

The *illness* ran a prolonged course with swinging fever, averaging 98·4° F. in the morning and 102° F. in the evening. Novarsenobillon on two occasions appeared to lower the temperature, but had no real influence over the course of the illness. More masses appeared on the skull and one on the sternum, but toward the end of life they diminished much in size and practically disappeared. The paraplegia extended upward and became complete to the level of the fourth dorsal segment, but with only a slight tendency to retention of urine until the end, when complete incontinence supervened. The patient died on Sept. 28th, 1929.

Necropsy showed a purplish-grey mass infiltrating the dura mater for 4 cm. in the region between D.2 and D.4; this pressed on the cord. Microscopy showed it to be lymphadenomatous in structure. Small lymphadenomatous deposits were present in the liver and spleen, one in each, about 1 cm. in diameter. The lymphatic glands at the hilum of each lung and along the posterior abdominal wall were enlarged and lymphadenomatous. The lungs showed patches of broncho-pneumonia, and lymphadenomatous cells were found in the consolidated areas.

The occurrence of paraplegia in cases of Hodgkin's disease as a result of a lymphogranulomatous infiltration of the structures around the spinal cord was pointed out by Parkes Weber in this country in 1923 and subsequently.[1 2 3] He collected notes on 20 cases of Hodgkin's disease and of leukæmia with spinal cord symptoms; of these, there were five definite and nine probable examples of the condition in the former disease. Eugénis,[4] in 1929, collected the recorded cases, 60 in all, classifying them into cerebral and spinal groups, of which the latter were the more frequent; many of these cases had already been gathered together and summarised by Parkes Weber. He described one case of granulomatous pachymeningitis, which he had personally observed, occurring in a patient suffering from Hodgkin's disease. Schaeffer and Horowitz,[5] writing in the *Presse Médicale* this year, also reviewed the subject, not having seen Eugénis's thesis; they described in detail two additional cases. The bibliography of the subject was fully reviewed by all these writers.

The tumours on the skull and chest seen in the patient described above were interesting. They decreased in size during the course of the disease, and had disappeared some weeks before death. It is unfortunate that no trace of these swellings was found at necropsy, since it would have been interesting to have known their exact pathological structure. Eugénis directed attention in his thesis to local osseous lesions as a possible source of cerebral symptoms in lymphogranulomatosis maligna. Poynton and Moncrieff[6] described the presence of nodules in the scalp in two fatal cases of glandular enlargement in childhood; these, however, were subcutaneous and not osseous. Thursfield[7] has reported a similar case, in which the subcutaneous nodules varied in size from time to time. It may be that there is, however, some connexion between these various nodules that occur in a large and somewhat vague group of diseases characterised by fever and glandular enlargement.

The interesting features in this case were: (1) the presence of paraplegia as a complication of lymphogranulomatosis maligna; (2) the lumps on the skull and chest; and (3) the scarcity of other gross lesions, both clinically and pathologically.

We are indebted to Dr. Parkes Weber for referring us to the articles by the French writers.

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MEDICAL SOCIETIES

ROYAL SOCIETY OF TROPICAL MEDICINE.

AT a meeting of this Society held on Oct. 16th, with Dr. G. CARMICHAEL LOW in the chair, Dr. FRANK MARSH spoke on the Ætiology of

Heat Stroke and Sun Traumatism.

Dr. Marsh, who is pathologist to the Anglo-Persian Oil Company, said that though a temperature of 109° to 112° F. in man had been recorded in cases of fever and heat stroke with subsequent recovery, its duration was never long; Halliburton and Mott had demonstrated that a temperature of 108° if long continued coagulates the globulin of the nerve cells of the brain, and the after-effects most commonly observed in cases of recovery from heat stroke were attributable to some lesion of the parenchymatous tissue of the brain. Heat loss in the human subject was regulated by sweating, and the efficiency of the mechanism depended on the humidity of the environmental air, the concentration of sweat glands per unit surface, and their degree of activity. In man, complete saturation with water vapour of the surrounding air at 90° caused an uncontrollable rise of body temperature; when the air was in motion, high degrees of humidity, provided they fell short of saturation, could be borne with impunity. Haldane in the course of prolonged sweating had described fatigue of the sweat glands, and there was some evidence that this was due to a low concentration of salt in the blood, or to the reduction of blood volume by loss of fluid. The relation of activity of sweating to the varying concentration of salt in the blood did not appear to be known. Europeans living in the Persian Gulf littoral had to sweat continuously; urine might be passed only about once a day, and usurpation of kidney function by the sweat glands might perhaps occur. Symptoms following prolonged exposure to sunlight must depend on either dark and luminous heat, or ultra-violet light, or the combined visible and invisible spectrum of the sun. Illness due to heat alone was common among miners and stokers, with the appearance of such conditions as heat exhaustion, heat cramps, and heat hyperpyrexia. Illness following exposure to the sun might stimulate these conditions, but recent medical text-books described, in addition, states known as sun traumatism, sunstroke, solarism and solariasis, and ascribed them to the rays of the blue-violet end of the spectrum. Certainly animals with hæmatoporphyrin in the circulating blood could be rendered comatose by exposure to ultra-violet light, and Manson-Bahr ascribed sun traumatism to the actinic rays; Willcox asserted that there was no evidence that rays other than heat rays were a factor in the production of sunstroke, but he seemed to be alone in this opinion.

EXPERIMENTAL PRODUCTION OF HEAT STROKE.

During the summer of 1929 Dr. Marsh had made a series of experiments with rabbits to decide the factors principally involved in the production of heat stroke. The rabbits were either exposed completely to the sun for varying periods, or their shaved heads alone were exposed, their bodies being cooled in a special box with an ice jacket. For an animal unprovided with sweat glands and relying for heat loss on vaporisation of water in its expired air, the rabbit was found to be capable of developing a high resistance to heat. The shaded albino rabbit could withstand air temperatures up to 115°; at 116° resistance broke down. In the direct rays of the sun a temperature of 148° could be tolerated, provided the coincident shade temperature was not over 90°; resistance broke down at a sun temperature of 161°, with a shade temperature of 106°. Black rabbits, however, proved unable to resist a sun temperature of 146·5°, the shade temperature being 84°.

It was interesting to compare the effects of a high environmental temperature on animals at different levels of the biological scale; the frog suffered from heat stroke at a temperature of 104°; the guinea-pig began to succumb when the shade temperature reached 110°, the rabbit at 116°, and man at about 130°. The nervous system of the rabbit resisted a temperature of 109° for one and a quarter hours; the temperature of collapse varied slightly in different rabbits, but in 11 experiments it equalled or exceeded 110°. A high mortality occurred among the rabbits which developed heat stroke, probably owing to the fact that the temperature at which a rabbit collapsed was near its lethal temperature. Man usually collapsed when his temperature was 104° or 105°, and the lethal level was probably about 110°, so that treatment quickly instituted was to some extent prophylactic. In the rabbit even rapidly applied and effective treatment could never be prophylactic, but only reparative. Experimental heat hyperpyrexia observed in rabbits closely simulated heat stroke in man; post-mortem examination of the animals which died revealed nothing beyond extreme congestion of all the organs including the brain; in two cases multiple petechial hæmorrhages were found in the intercostal and accessory muscles of respiration, and the skin of the ears and back. Pulse and respiration were rapid until a few moments before collapse, when both slowed down; at the time of collapse cyanosis was always present.

Twenty-eight experiments were performed on rabbits wholly exposed to the sun. In each experiment two albino and two black rabbits were used, one of each colour being kept damp by repeated spraying with water. Among seven albino and five black rabbits which were exposed damp no heat stroke developed and no marked rise of temperature was found, except in one black rabbit whose fur was accidentally allowed to dry. Of the dry rabbits, seven albinos died of heat stroke and two survived; six dry black rabbits all succumbed.

It was clear from these experiments, Dr. Marsh said, that heat alone was responsible for the condition of heat stroke. Mere wetting could not affect the penetrative state of the rabbits' fur by sun rays; it was inconceivable that anything more than coolness could result from wet fur. Moreover, although the melanin of the black rabbits' fur and skin was impenetrable by green and ultra-violet rays, these animals suffered more severely, and were killed by heat hyperpyrexia at a lower sun temperature than albinos, and at a time of year when the ultra-violet element of the sunshine was relatively weak. As for the damp albinos, they had been utterly unprotected from ultra-violet light, and with rabbits of either colour it was found that bright sunlight and

sun obscured by cloud and smoke caused heat stroke equally well. The evidence was strongly against ultra-violet rays having any influence on the production of heat hyperpyrexia or sun traumatism.

Following prolonged exposure of the shaven heads of seven albino rabbits to sunshine while their bodies were kept cool, two were killed within 48 hours and their brains examined; there were no changes in the nerve cells, and no signs of capillary thrombosis were discovered. It was found that it was impossible to injure rabbits by exposing their heads to the sun provided their bodies were kept cool. On the other hand, an albino rabbit with its head kept cool in the box and its body exposed to the sun died after half an hour's exposure. Dr. Marsh concluded that the rays of the sun had no direct action on the brain tissue of an exposed rabbit; whether it could be assumed that these results applied also to man he was uncertain.

A HUMAN CASE.

The experiments of Hall and Wakefield on heat stroke produced artificially in dogs showed that both the lactic acid and urea in the blood increased after exposure, while the non-protein nitrogen showed a commensurate change with the blood-urea. In the Persian experiments, determinations of the blood lactic acid were performed on four animals immediately after their collapse; values of 63·4, 279·9, 182·7, and 141·6 mg. of lactic acid per 100 c.cm. of blood were found. The plasma carbon dioxide, estimated in one hyperpyrexial rabbit, had given a value of 12 c.cm. per 100 c.cm. of blood. A high blood lactic acid and a low plasma carbon dioxide content appeared to be fairly constant findings in heat stroke. In one human case studied during the summer, the patient had been a member of the Persian guard who had given a history of feeling unwell for five days; on admission to hospital he had headache, abdominal pain, constipation, and weakness. His temperature was 104° and later in the day went up to 109·6°; repeated cold sponging had kept his temperature in the region of 102° for two days, but on the third day it rose to 108·5° in the rectum, and the patient was removed to a heat stroke ward. Blood analysis had shown lactic acid 100 mg., urea 84·7 mg., sugar 80 mg., and chlorides 436·7 mg. per 100 c.cm. of blood; some agglutination occurred with *B. paratyphosus* B. The patient died on the third day after admission with a temperature of 102·8°. Only 500 c.cm. of urine were passed from the morning of the second day in hospital to the time of death; earlier examination had shown the total chlorides to be 30 mg. per 100 c.cm. and the urea 2 g. per 100 c.cm. In the later stages no chlorides were present. It was conceivable, however, that this was not an uncomplicated case of heat hyperpyrexia, as the positive Widal reaction made it impossible to exclude typhoid fever. Dr. Marsh was convinced that, as sweat glands can apparently excrete only salt water, and not water alone, some level must exist at which the blood concentration of chloride was at its absolute minimum consistent with life, and that at that level some mechanism must exist which stopped the activity of the sweat glands. Certainly in the case under review with a blood chloride of 436·7 mg., and no urinary chloride, the patient was unable to sweat, in spite of large quantities of salt given by mouth.

In conclusion, Dr. Marsh said that his experiments indicated that the host of diseases with varied symptomatology ascribed to the effect of the sun could be replaced by one disease for which he suggested the name "hyperpyrexia due to heat." The essential phenomena of this condition were independent of alteration of the salt concentration of the body, since they occurred in the non-sweating rabbit and dog. There was no reparative treatment, and prophylactic treatment alone appeared to be effective.

Discussion.

Sir CHARLES MARTIN said that he agreed that ultra-violet light had nothing to do with sunstroke; the incidence of sunstroke on high mountains, where there was much ultra-violet light in the spectrum, was small. He was not sure, however, that sunstroke might not exist as a separate entity, apart from heat stroke. Using rabbits in Egypt he had found a difference of 2·5° between the superficial and deep parts of the brain after exposure to sunlight. The contribution of sunlight to the thermal balance sheet of the individual must be considerable. Sweating could be increased with practice; in early sweating the sodium chloride content was low, but as the glands tired the concentration of salt increased.

Sir WILLIAM WILLCOX said that Dr. Marsh's experiments confirmed his clinical observations. But heat stroke arose not merely as a result of the cessation of sweating, but from an autointoxication. He mentioned the case of Sir Victor Horsley, in whom in spite of treatment repeated attacks of hyperpyrexia arose as a result of heat stroke, indicating a profound change in the body mechanism. Some cases ran a temperature like a typhoid patient for weeks; usually the knee-jerk disappeared in the early stages and might take some weeks to return. He would like to know whether the blood and urinary creatinin rose. He described a gastric type of heat stroke which was often fatal, and which he preferred to treat with colon washes and large doses of alkali to combat the toxæmia.

Prof. M. F. PEMBREY said that the War Office had reached the same conclusions as the experimentalists from experience with living men. He disagreed with the theory of a toxæmia, and thought the condition depended on a disturbance of the salt balance; any disorder, such as paratyphoid, helped to upset this balance and to make the patient more liable to heat stroke. Salt should be given as a routine part of the treatment.

Dr. ALDO CASTELLANI agreed that ultra-violet light played no part in the production of heat stroke; in some cases heat stroke was indirectly responsible for intestinal disturbances, and in a few might cause the lighting up of an infection in a carrier—paratyphoid for example. In practice it was useful to separate heat stroke and heat exhaustion, as the treatment was different: in heat stroke the patient required to be cooled by suitable methods, but in exhaustion the appropriate treatment was stimulation, both by substances given by mouth and by injections of such drugs as camphor and strophanthin.

Sir FRANK CONNOR said that as a surgeon he had been struck by the number of ill persons who were attacked. Referring to the difference between black and white rabbits, he said that it was interesting to see how the same principle failed to apply throughout nature; in India the black cows seemed to suffer no more than the white. Residents in the East learned to sweat more easily, and the gift persisted even after their return to England.

Wing-Commander H. E. WHITTINGHAM said that among more than 20 cases occurring in members of the Royal Air Force in Iraq, many had been of the choleraic type; in two patients evidences of malignant tertian malaria were found, and another gave a positive Widal for paratyphoid B. Treatment by

intravenous sodium bicarbonate and glucose had been found to be valuable.

Dr. A. EIDENOW said that in recent experiments with Sir Leonard Hill he had found that animals could be killed by light alone. He doubted whether Dr. Marsh's experiments, except those in which the heads of the animals were shaved, had much to do with the visible spectrum, and he would be interested to know what results would be found if they were repeated under conditions which excluded the infra-red rays. In his experiments with Prof. Hill it had been found that, in animals which had been killed by light, areas of necrosis in the gut were present on post-mortem examination, there was distension of the stomach, and patches of pneumonia in the lung. With ultra-violet light a radiation toxæmia, apart from heat stroke, had been found. Identical pathological pictures had been produced with the β radiations of radium. Apart from any heating effect it had been thoroughly demonstrated that animals could die of a pure light stroke, by means of intense irradiation, carefully controlled, for several hours.

Sir T. CAREY EVANS mentioned a large number of cases of heat stroke occurring on a troopship in the Red Sea, where none of the patients had been exposed to direct sunlight. The heat balancing centre was easily upset by alcohol, and the high incidence of death from heat stroke among sergeant-majors in Lucknow was due to their custom of taking a bottle of beer to bed with them on hot nights.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.

THE annual general meeting on Oct. 17th opened with an address from the new President, Dr. HAROLD KERR, medical officer of health for Newcastle-upon-Tyne and professor of hygiene in the University of Durham, on the

Future of Municipal Hospitals.

Great dissatisfaction with the arrangements under the old poor-law had existed, Prof. Kerr said, and ten years ago Bradford had given a lead to the country by transferring its poor-law hospitals, to the local authority. Its example had been followed by Willesden and Aberdeen, and had in time led to the Local Government Act of 1929. The divorce of health services in that Act from consideration of the financial position of the beneficiary was undoubtedly due to the pioneer work of Dr. John Buchan at Bradford. By this Act local authorities had become possessed of considerable hospital accommodation, and upon medical officers of health rested the first charge of advising authorities wisely.

Poor-law hospitals had in the past served the destitute classes only. No matter how long the waiting-list at other hospitals, there had been no coöperation. Some guardians had tried to popularise their hospitals, but the poor-law stigma hung over the municipal hospital, and the general public fought shy of it. Long before the Act had come into force the Newcastle authority had declared that its policy was to depauperise sickness and relegate all functions connected with health to the health committee. It had formed a joint committee of members of the health committee and representatives of the local voluntary hospitals. This committee had been a real step forward in the coördination of hospital services and in bringing about closer mutual understanding. Much work had been done privately before each meeting so that little time was wasted on explanations, and each member knew beforehand the pros and cons of the matters to be discussed. The committee fully endorsed the declared policy of the local authority that the hospitals should be administered in such a way as to provide for the best possible results for the people of Newcastle as a whole.

One large new block of the poor-law hospital, containing modern annexes, operating theatres, and electro-therapy plant, had been established as a first-line hospital, staffed like the best type of voluntary hospital, for acute medical and surgical cases. Its purpose was to supplement and ease the pressure on the Royal Victoria Infirmary. This part contained about 150 beds. The rest of the hospital, over 500 beds, was to be occupied by less acute cases. Patients with pulmonary tuberculosis were transferred to the municipal sanatorium and hospital for advanced cases, midwifery cases to the voluntary maternity hospital and Royal Victoria Infirmary, and mental defectives to the appropriate institution. Transfers to other hospitals involved, of course, some financial arrangement. The only out-patients to be seen at the municipal hospital were discharged cases, as there was an adequate supply of general and special departments elsewhere in the city.

STAFFING THE HOSPITAL.

The ex-guardians had favoured whole-time appointments but had not been prepared to pay salaries that would attract good men, although strongly in sympathy with the desire to put the hospital in the very front rank of efficiency. They had, however, been persuaded. For the acute block a part-time visiting staff on the clinic system had been appointed. A senior physician and surgeon, as directors, received £300; one assistant physician and two assistant surgeons received £500 each; one medical and two surgical registrars, £250 each; a part-time radiologist £300, and residents £100 each. There had been no lack of applications, and the hospital had been fortunate in procuring as directors two recently retired members of the staff of the Royal Victoria Infirmary. Both were on the teaching staff of the medical school, a fact which would facilitate the use of the municipal hospital in medical education. The mere presence of the medical student—that most critical of all onlookers—was a great stimulus to the work of the hospital staff.

The original medical superintendent and his deputy would continue at their former salary of about £1200 and £600 respectively, but the assistants would be replaced by a senior medical officer at £300–£500 and two house surgeons and two house physicians at £100 each. The medical superintendent would remain in complete administrative control, but was relieved of clinical work except the certification of lunatics—a subject on which he was expert. His deputy was specially qualified as a surgeon, and would continue to act as such for the larger block of the hospital. Formerly there had been two consulting surgeons and a consulting physician receiving £100 each, and an ear, nose, and throat and ophthalmic surgeon receiving £25 each. These appointments were to be terminated, but the two last would probably be renewed. Efficient laboratory facilities had been provided. Recommendations for appointments would be made by a small committee consisting of three representatives of the College of Medicine, one of the local division of the British Medical Association, and one of the staff of the Royal Victoria Infirmary. The medical officer of health or his deputy attended all meetings of this

committee by request. The actual appointment would then be made by the health committee. The nursing staff would also require enlargement, and an almoner service would be provided.

To avoid the interposition of the relieving officer, admission was to be by direct communication between the private doctor and the medical superintendent. The relieving officer would only make inquiries where payment could not be undertaken by definite agreement and partly in advance. Ultimately the assessment of means was to be referred to the city treasurer, instead of the relieving officer. In time it was proposed to set up a sort of clearing-house to allocate the patient to the appropriate institution, thus serving all the local hospitals.

A gradually increasing admission-rate was anticipated, especially from respectable independent middle- and working-class people who could not afford a nursing-home and did not like charity. It must not, however, be forgotten that the hospital's first responsibility was the care of the indigent sick. To meet the increase of patients it was proposed gradually to transfer workhouse inmates to cottage homes, almshouses, and employment centres, so that the health committee had the entire establishment for those needing medical care.

Voluntary contributions to the hospitals were almost bound to diminish, and there was strong reason for the establishment of contributory schemes to enable the voluntary hospitals to continue their valuable work. Newcastle hoped to establish a central record office where all assistance given from public or voluntary sources should be noted, in order to keep a check upon abuse, reduplication, and overlapping.

Such, said Prof. Kerr, was the arrangement in Newcastle; in country areas the transfer might be a slower and more difficult business, necessitating reclassification and remodelling of institutions and the appointment of local practitioners to the visiting staff. Upon the rearrangement of local authority areas would depend much of the efficiency of the less populous parts of county districts. If each was centred upon a fair-sized town it would be much easier to arrange an effective hospital service. The potentialities for usefulness of the new municipal hospital were without limit both in the treatment and in the investigation of disease.

THE MUNICIPAL HOSPITALS OF LONDON.

Dr. W. BRANDER paid a tribute to the work of boards of guardians possessed of very limited powers. The complexities of the London hospital service made the work there peculiar and difficult. The organisation most suitable in London might not be the best for any other locality. There were 29 hospitals containing over 16,000 beds, 14 other institutions with 11,500 beds, and 34 special hospitals with 1500 beds transferred from the Metropolitan Asylums Board. The Council also controlled 20 mental hospitals, housing over 31,000 patients. There was, however, very little surplus accommodation. On the whole the poor-law institutions were well-built, well-equipped, and well-staffed, but the Council was concentrating as a primary measure on the defects. They wished every hospital to be supplied with an adequate laboratory and radiological and electrotherapeutic department, and certain group-laboratories would undertake more specialised work for an area. Out-patient attendance was to be limited to casualties, after-care of surgical cases, consultations, and antenatal patients. There was a gross deficiency of convalescent homes, which was to be remedied. The Mental Treatment Act would create a new public health service, and the Council was most anxious to centralise the work. Consultant staffs were to be attached to all institutions, and undergraduate and post-graduate education encouraged. The respectable poor needed municipal hospitals without charity, and should be catered for. Coöperation with voluntary hospitals might help to relieve the long waiting-lists of these institutions.

Dr. J. J. BUCHAN expressed his general agreement with Prof. Kerr's remarks. The indigent sick did not mean the penniless sick but the needy sick, those who could not afford institutional accommodation for themselves, and it was the duty of local authorities to provide for all these. The voluntary hospitals could not in the future, as in the past, hold themselves out as charitable providers of that which it was the duty of the local authorities to ensure. In the course of time the public would realise this duty. The voluntary hospitals had set a marvellous example for county borough councils and county councils to follow; they had failed only in raising enough money to maintain their service. The municipality of Bradford had made a contributory contract with its inhabitants, guaranteeing beds to contributors when they fell ill. The voluntary hospitals' contributory schemes gave no guarantee.

In reply to questions the PRESIDENT said that the aged infirm remained for the present under the public assistance committee, but were to be taken over by the public health committee as soon as possible. The medical officer of the public health committee automatically became medical officer to the public assistance committee's institution. Clinics should be in the municipal hospital. He agreed that in small boroughs, where there might be no accepted consultants, the medical superintendent ought to be a specialist in some line.

HUNTERIAN SOCIETY.

AT the inaugural meeting of this Society, held on Oct. 20th at Simpson's Restaurant, Cheapside, Prof. A. W. SHEEN delivered his presidential address, entitled

The School of Health.

Prof. Sheen took as his text a remark made by John Hunter in a letter to Jenner in 1775: "Why think? Why not try the experiment?" The theme of his address was that a new institution should be founded in this country, which should be named the School of Health. The main objects of the school would be to demonstrate measures for the promotion of fitness (using the word in the eugenic rather than in the athletic sense) and for the prevention of disease. It was necessary to determine what was meant by the terms "health" and "disease." There was no such thing as real health. Apart from antenatal defects, from the moment of birth the individual had to maintain a precarious balance between toxins and antitoxins, and such health as fell to human lot was a sort of optimum condition and varied with every individual. What was far more important than disease was disorder, which was wrong structure or wrong functioning, and it was to disorder and its prevention that he dedicated his imaginary school. The present attitude towards medicine on the part of the public was, broadly speaking, a demand for

curative medicine. The problems of preventive medicine did not directly concern the general practitioner, whose primary object was the treatment of disease. Could these circumstances be altered, so that every doctor became, in the broadest sense of the word, a medical officer of health, not of healing? Prof. Sheen went on to draw a picture of the large extent of unfitness and disorder prevailing in the community. At the present moment we zealously cherished the unfit, taking few or no steps to prevent their propagation. The children of defectives were also preserved in the general lowering of infant mortality. There was an enormous increase at the present time in the numbers of those receiving poor-law relief, in itself an index of unfitness. Very little reading of eugenic literature made it evident that unfitness was increasing, and was alarmingly prevalent. He referred to the report of the late Sir James Galloway to the Ministry of National Service in 1920, which was based on the complete assessment of men of military age, and showed that 67 per cent. of these suffered from different grades of unfitness. With regard to mental deficiency, he noted from a Treasury report that twice as much money was expended under this head in 1928 as in 1921. It was unfortunate that the National Health Insurance records had never been utilised to show the prevailing morbidity. An analysis of the records would be, of course, a very costly matter, but one fact stood out—namely, that during recent years there had been an enormous increase of sickness claims under the National Health Insurance Acts. He believed this increase to be a real one. With regard to the cost of invalidity, he described some calculations he had made which brought out the result that in one way or another this nation was spending £300,000,000 a year on health measures.

Turning to describe his proposed school of health, Prof. Sheen said that it would be a voluntary institution, under its own constituted authority, and free from other control. He wanted it to take the foremost part in the reshaping of public opinion and the creation of what might be called a national health conscience by the evidence of its work. He visualised the school situated in some great health park on the sunny uplands of Hampshire or Sussex. In design the buildings would be perfect of their kind, but of the plainest and cheapest type, for the housing requirements of scientific work were constantly changing. All that was wanted was easy expansion and internal convertibility. All the work would be designed for education in and the furtherance of the common health. He thought that even a sum of ten millions could not be regarded as excessive for the provision and endowment of such a school, in view of the savings which such a school, when successful, would effect. If such a school ever came into being, in due course money would come to it from its work. With regard to the staff of the school, these would be selected eugenically, and would be largely full-time people, not only medical men, but a host of others—geneticists, eugenists, sociologists, anthropologists, agriculturists, chemists, physicists, geologists, engineers, lawyers, experts in child study, and in education—in fact, all who could work for human welfare in their special provinces. Consultant experts would be called in from outside.

THE FUNCTIONS OF THE SCHOOL.

With regard to the work of the school, he indicated certain lines on which it might proceed. One of these was with regard to eugenic marriage. The most important thing for the human race was to be born well, but while he found that there was a general acceptance of the fact that the application of biological principles with due regard to social factors would result in human betterment, yet, when improvement of racial conditions on these lines was indicated, there was a general throwing up of hands. Dean Inge had rightly said that the methods of the stud farm could not be applied to human beings, and that the only recourse was to proceed by way of the education of the individual. But he would suggest that one of the departments of his school might have the aim of furthering eugenic marriage. He believed that the majority of human beings did desire healthy partnerships and fit children, and that there would be some who would be willing to accept advice on a proposed marriage from some who could speak with authority, and that others would come to such authority to be guided to a mate. The furtherance of eugenic mating might be a very useful function of his school.

Another function of the school would be to receive expectant mothers, prepare them for birth, and give them the necessary education in infant care and welfare. Child life and education would be responsible for many of the activities of the school. He felt that education and health measures could not be dissociated, and for his part he would welcome in this country a complete merging of the Ministries of Health and Education. He also strongly maintained that education could be directed to vocation without losing any of its influence on character. His university friends scoffed at what they called "job factories," and talked about the peculiar discipline and breadth which resulted from an undirected education. But for his part he felt that education could be directed according to the aptitudes of the individual, and that the universities had not been wise in their obliviousness to vocational training. He further visualised in his school what he called a health village—a colony of hygienic dwellings, some of the people being employed in healthy industries developed in the school. All kinds of observations and experiments would be made. Special investigations would be made on selected groups. The school would contain a health clinic, and, indeed, there was now a tendency to develop in connexion with ordinary hospitals, not only clinics for disease, but clinics for health.

A NEW KIND OF HOSPITAL.

With regard to curative medicine, he wanted to associate with the school a hospital of quite a new kind, to conceive it only as one of the many departments of the school. In selecting patients—or, as he preferred to call them, subjects—preference would be given to those suffering from the early stages of disease—in other words, those who were the out-patients of an ordinary hospital would be the in-patients at this school. The hospital would be a research hospital, and the primary question asked with regard to every subject suffering from any illness would be, not "What is it and what shall I do?" but "Why is it, and how can it be prevented?" A psychiatric clinic, a clinic to study the foci of disease, a "surgery to prevent surgery," to use a phrase of Lord Moynihan's, were all examples of the hospital's work.

With regard to general health work in the school, the subjects for study would include environmental conditions, population and distribution, the lay-out of estates, urban and rural conditions, the effect of clothing, climate and air, sanitary services, food,

drink, and drugs, occupational and recreational activities, psychology and hygiene, health legislation, and the basic sciences. The school would be a kind of health clearing-house, where health information from every source would be received, sifted, and proved out. It would include a great library, and the members of its staff would travel far and wide to give advice and to receive information. The school would receive students, all of whom would be selected, none being able to claim admission, and some would pay, some would pay nothing, and others would be paid. The students at first would be post-graduates, but later he hoped to see ordinary medical students received. The main endeavour would be to produce a medical officer of health in the widest possible sense of the term. Medical education in this school would be directed to vocation as early as possible. It would include the study of human biology, environmental and nutritional effects, and with this would go embryology, and a study of the results of developmental failure. The study of structure and function would never be divorced, because the one was a meaningless mess without the other. He briefly sketched a proposed curriculum, and said that the student in the school would be trained in the promotion of fitness and preventive medicine in the widest sense. Prof. Sheen concluded by saying that what he was asking for was that something might be done, some example be given of the action that could be taken to stop the physical and mental degeneracy of the race. He claimed for his suggestions that they were constructive, and offered something for health benefit in the hope that the example would incite to more.

A vote of thanks was accorded to Prof. Sheen on the motion of Sir W. ARBUTHNOT LANE, who said that, within its limits, the New Health Society had been doing what Prof. Sheen had visualised, and was seconded by Dr. LANGDON BROWN.

SHEFFIELD MEDICO-CHIRURGICAL SOCIETY.

AT the opening meeting on Oct. 8th the President, Prof. GRAHAM SIMPSON, delivered his inaugural address entitled

SANCTA SIMPLICITAS.

It was related, he said, of John Hus that when being led out to the stake, and noticing in the procession an old lady bowed down by a large fagot, he expressed neither surprise nor resentment, but exclaimed: "O, sancta simplicitas!" Nearly all progress, he continued, consisted in applying this holy simplicity to the problems of life. Experience in examining had taught him that one of the defects in modern medical education was the flooding of the student's mind with the details of innumerable diseases when his groundwork of anatomy and embryology was insufficient. From a medical point of view, the first 30 years of this century might be named "the age of the scopes or the era of extended vision"; simplification had been brought about by the use in diagnosis of the œsophagoscope, bronchoscope, and cystoscope. The discovery and ever-extending use of X rays were, he thought, another example of such simplification. The same principle, moreover, held good in the domain of treatment; 50 years hence our successors in surgery might look on much of the elaborate ceremonial of the operating theatre as mere ritual, and smile, as we do, at the era of the carbolic spray. In fractures the simplicity he had in mind was attained only in the treatment by acute flexion of those occurring near joints; all that was needed was an anæsthetic, some wool, a bandage, the X rays, and some common sense. Prof. Simpson concluded his address by applying the principle to some of the problems of ordinary life.

REVIEWS AND NOTICES OF BOOKS

The Chest Roentgenologically Examined.

Annals of Roentgenology. Vol. XI. By L. R. SANTE, M.D., F.A.C.P., F.A.C.R. New York: P. B. Hoeber. 1930. Pp. 561. $20.

A BOOK in English on the radiology of the chest has been long overdue, no comprehensive work having appeared since that of Wessler and Jaches' volume published in 1923, and now out of print. In this latest addition to the Annals of Roentgenology Dr. Sante has produced a masterly compilation.

His arrangement of the subject matter into three parts is original. Part I. deals with the essential preliminaries to interpretation, Part II. with the evidences of disease as it affects lung structure, thereby narrowing down the field of possibilities, and Part III. gives a detailed description of each disease, from early to late manifestations, including the differential diagnosis. Some 400 excellent radiograms and line drawings illustrate the volume, but these are arranged in the reverse order to that obtaining in other works of this nature; for though the radiograms were obviously taken with the patient facing the radiographer, the shadow of the heart appears on the left side of the picture. This is a little disconcerting to those unfamiliar with radiographic interpretation, but, apart from this, the radiograms are very clear, having lost little in reproduction. In view of the demand for the 2-metre distance throughout Europe, it is noteworthy that the author uses a 4-feet anticathode-film distance.

The author considers that radiological examinations are best made by judicious combination of both film and screen methods, but he goes on to state that "fluoroscopy should not be performed as a routine under any circumstances, since such exposure of the operator is unjustifiable and unnecessary." These views are not universal, the best authorities in Europe recommending routine screening in all cases. No reference is made to fluoroscopy in the lordotic position which is so useful in detecting small interlobar effusions. Lipiodol technique is given in detail, with many illustrations. The author apparently favours the supraglottic route, reserving the intercricothyroid method for children, but he makes no particular reference to the value of lipiodol in demonstrating blocked bronchus in bronchogenic carcinoma, either in the text or by radiograms. On stereoscopy the author is not an enthusiast, for him views in the anterior and lateral planes sufficing. He considers that great skill can be acquired in interpreting flat films. His opinions are the more interesting in view of the recent sojourn in America of English physicians, some of whom returned to their own country full of enthusiasm for this special method.

The various pulmonary diseases are described in detail, and of special interest is the section on acute diseases, especially the pneumonias. The radiological examination of patients suffering from pneumonia is not very frequently undertaken in this country,

but the author appears to have made a special study of these diseases, even including radiograms, which, according to him, are typical of epidemic influenzal pneumonia and the pneumonia peculiar to Friedländer's bacillus. Pneumonoconiosis, including silicosis, receives full attention, though no special reference is made to the findings in asbestosis. The various manifestations of pulmonary tuberculosis, both in childhood and adult life, are fully described and admirably illustrated. Intrathoracic malignant disease receives full consideration. The author appears to consider sarcoma of the lung as a definite entity, but rare. He scarcely mentions benign tumours and gives no radiograms illustrating the value of diagnostic collapse. No reference is made to dermoid cyst and scant notice is taken of hydatid cyst of the lung. The section on massive idiopathic atelectasis is excellent and profusely illustrated. The author gives no explanation as to the mechanism of its production, but offers an ingenious method of treatment.

The book is largely clinical in nature, and amply illustrates the necessity of correlating the radiological findings with the clinical history. There is a full index and an ample bibliography, though the paucity of reference to English authors is striking.

L'osteo-synthèse métallique dans les fractures diaphysaires.

By ROBERT FRANTZ, Ancien interne des Hôpitaux de Paris. Paris: Masson et Cie. Pp. 190. Fr.35.

THIS is an experimental study of the various methods of fixing fractures by means of metallic appliances. The method of study is obviously limited, since dogs will not submit to the restraint of retentive apparatus and the actual conditions are not quite comparable with those in the human subject. However, valuable knowledge has accrued and emphasis been laid upon points whose significance was not sufficiently appreciated. It emerges that intolerance to metallic appliances is due either to imperfect fixation or to encircling bands or wires being pulled unduly tight. The authors show that the pressure per unit area can be minimised by increasing the size of the retentive apparatus. This has been done by using the apparatus of Contremoulin, which consists of a thin plate of aluminium bronze perforated in many places which almost completely encircles the bones and is fixed by extensions similar to Parham's bands. It is mechanically efficient and if applied at the right tension does not cause bony necrosis and, in fact, induces very slight reaction in the underlying bone. It causes irritation only if too loosely or too tightly applied. The author also recommends Cunéo's method of a staple fixed by encircling wires. But in this case a retentive plaster must also be applied. Finally, it is laid down that open operation should be employed only when bloodless methods have proved insufficient.

Trial of Captain Kidd.

Notable British Trials. Edited by GRAHAM BROOKS, Barrister-at-law. London: W. Hodge and Co. 1930. Pp. 223. 10*s*. 6*d*.

Captain William Kidd is a sad example of the game-keeper turned poacher. A seaman of good repute up to the age of 50, he was engaged under Admiralty warrant to capture French shipping in the year 1695 and was also commissioned to apprehend pirates. Off the Malabar coast he took vessels of several nationalities, sharing the cargo with his crew. When Kidd was finally brought home and tried for piracy and murder, one of the chief witnesses for the Crown was the ship's surgeon, Robert Bradinham. Bradinham's qualifications are not disclosed in the witness-box. A member of the crew naturally addresses him as "doctor" during the trial; but Kidd himself, when cross-examining, calls him rogue and rascal and suggests that he robbed the surgeon's chest. Kidd also, somewhat injudiciously, brought out the fact that he gave Bradinham one full share of the spoil; from the context it appears that there were 160 shares and that for this purpose the surgeon was rated at least no lower than an able seaman. The only part of Bradinham's evidence which is of professional interest is his brief but sufficient testimony on the murder charge. Kidd had broken the head of Moore, a gunner, with an iron-shod bucket. Bradinham says simply "Moore died the next day; the wound was small but the skull was fractured; I believe that he died of the wound." Kidd was hanged at Execution Dock in Wapping after his conviction in 1701. In a dying speech he blamed his mutinous crew for the piracies and he protested against perjured witnesses. He was sorry he struck Moore in a passion; he really had great love and respect for him. Kidd had a genuine grievance in having been deprived of certain evidence (French passes found on some of the captured ships) which he relied upon. But Mr. Graham Brooks, who edits the trial in the "Notable British Trials" series, holds that there was no substantial miscarriage of justice. Macaulay's "History" has a readable account of the Kidd episode, though the late Sir J. K. Laughton found it "more than usually inaccurate."

Réaction de Vernes à la résorcine et infection tuberculeuse.

By ROBERT LÉVY, Ancien Aide de Clinique, Préparateur à l'Institut d'Hygiène et de Médecine Préventive de Nancy. Paris: N. Maloine. Pp. 162.

THIS book consists of a practical description of the Vernes test for tuberculosis, together with statistical tables of results and other cognate details. The test is based upon the fact that when an aqueous solution of resorcine is added to the serum of tuberculous patients flocculation results; the amount of the flocculation is measured by the photometric method of Dr. A. Vernes at the Institut Prophylactique in Paris, which estimates the loss of light when a beam is passed through the fluid under observation. The first description of the technique was published by Dr. Vernes in 1926. Owing to the expense of the initial outlay on the apparatus the test has not been much used in this country. French and American workers report encouraging results with the test, which the author of this book now confirms. The first chapter of Dr. Lévy's book contains a description of the technique of the method and the rheometer and photometer which are necessary for the purpose of the test. The rest of the book is devoted to an account of the various types of tuberculous case, early and late, on which Dr. Lévy has tested the reaction. Perhaps the most interesting is a group of 46 patients who had received prophylactic inoculations of B C G vaccine. The results here showed that the serum of patients who had been injected with B C G gave optical densities rather higher than normal, but not comparable with those of definitely tuberculous patients. A short bibliography and a number of illustrations of apparatus are included.

THE LANCET.

LONDON: SATURDAY, OCTOBER 25, 1930.

UNDERGRADUATE TEACHING IN PUBLIC HEALTH.

In the Section of Preventive Medicine at the Winnipeg meeting of the British Medical Association, Prof. A. GRANT FLEMING, of Montreal, outlined a procedure which had been instituted at McGill University with intent to bring the medical student into early contact with instruction in public health and preventive medicine. The following is the plan. During the first year of his studies the pupil is introduced to the subjects of public health and preventive medicine with special reference to personal hygiene, while in the second year a course of lectures deals with public health administration and organisation. In the third year there are lectures on mental and industrial hygiene, while other fields where social hygiene plays a part are investigated by verbal instruction in field visits, or at laboratory demonstrations. In the fourth year a course of lectures deals with the preventive aspect of communicable diseases, the student being thus made aware in a broad way of duties which await him in his work as a family practitioner. By a personal study of the public health over a selected area, visiting a centre in the area, he becomes familiar with public health activities in actual operation, on which he has to frame a report for discussion with one of his teachers. In the fifth year, on a principle of option, certain of the students receive special instruction in the three main subjects of child welfare, mental hygiene, and industrial hygiene. This is a very detailed course, though several of the universities in the United States are in different ways already offering similar opportunities to their students. The usual method there is to introduce the subject of public health in the third year of the curriculum, but as there may be a method of option in force by which the student can occupy a certain period of his time, when he chooses, in pursuing his medical work along certain lines, it is often open to the American to acquire, before he is qualified, a considerable knowledge of public health.

In the British curriculum the accepted pattern of medical education undoubtedly overlooks the possible value of early familiarity with the principles of prevention. The medical student approaches the study of medicine as meaning the acquisition of the art of diagnosis and of the appropriate methods of treatment, and thus comes to regard the practice of medicine as implying the care of the sick, and nothing else. It was this position which stimulated Prof. A. W. SHEEN to include a department for students in his Utopian School of Health (see p. 907); and led Dr. G. F. BUCHAN, at the Congress of the Royal Sanitary Institute held last June in Margate, to point out that the majority of medical students, though destined for general practice and presumably ready to enter upon that practice from the date of registration, were little informed in the early manifestations of disease, and were thus unable to detect its premonitory or incipient stages, or to see where prevention might play, or might not have played its part. An interesting debate ensued upon Dr. BUCHAN's paper, in which Prof. W. W. JAMESON drew attention to the resolution adopted in 1923 by the General Medical Council that two post-graduate years must elapse before the candidate could take the diploma of D.P.H. It is clear that this regulation is an invitation to educational authorities to relegate to post-graduate instruction the subject of public health, an invitation which it is only natural that they should welcome, seeing the elaborate and arduous nature of the studies with which the statutory period of the student's training is filled and overfilled. That period is admittedly insufficient to allow of a real mastery of the subjects, and the usual criticism here is that too much attention is paid to details by the teachers, while examiners are too often found making their inquisitions along side-lines in place of testing the students in regard to general principles. Such a view is easy to take, but it is not easy for any teacher to decide the point at which his information may be held superfluous on the ground that it is too detailed. For fundamentals can only be imparted if demonstrations, examples, and comparisons of a more or less elaborate nature are supplied as links in the story or assistance to memory. If the British curriculum is to find room at each stage for organised instruction in public health on the pattern of McGill University some subjects or sections of subjects must be recognised as outside the necessary course, perhaps only to this extent that candidates for qualifying examinations will not be compelled here to respond to tests—questions may be asked and credit may be obtained by answering them, but failure to answer them will not determine the issue.

Is the argument, that the study of prevention is applicable to all diseases and behind all therapeutics, so forceful that time must be found for it in the ordinary medical curriculum? The answer of the General Medical Council to the question is unequivocal, for eight years ago the Council revised the curriculum with the express object that throughout the whole period of study the attention of the student should be directed to the importance of the preventive aspects of medicine. The medical practitioner cannot yield his best unless he possesses the preventive viewpoint. He is, as Sir GEORGE NEWMAN has said, its exponent, interpreter, and practitioner. But it is too late to emphasise the preventive aspect of medicine when the whole of the study years have been filled alone with the curative aspect. It is not a question of time; it is a question of outlook. Prevention cannot, of course, be visualised by those who have

no knowledge of what they are to prevent; and the normal and healthy can only be appreciated by a knowledge of deviations from normality and health; but, unless the student, as he travels up the pathway of knowledge, learns to look back from the gross and obvious results of disease to their imponderable beginnings, and from there to the principles of right living which will avoid these beginnings, his education as a member of a social community has been a failure. He may become a popular and even a successful practitioner, affording relief in all kinds of suffering and disability, but he will be unable to make the least contribution to what is the goal of present-day medicine—the avoidance of occasions which lead to disease and infirmity.

TWENTY-ONE YEARS AT ALTON.

ON March 22nd, 1908, Sir WILLIAM TRELOAR, then Lord Mayor of London, discovered at Alton in Hampshire a group of bungalows, situated on 70 acres of sloping grassland, which had served as a hospital for soldiers wounded in the South African war, and were resting empty. "Here," he wrote in his diary, "was an opportunity." A Mansion House fund was opened, and in the same year was started the Cripples' Hospital which bears his name. During the 21 years which have elapsed since then more than 5000 children have passed through the hospital, of whom about 90 per cent. have been restored to health, after an average stay of almost exactly a year. For the first half of this time the cases admitted were almost exclusively tuberculous lesions of the spine, hip, and knee, for which treatment was hardly available elsewhere, and there was full opportunity for that intensive and uninterrupted study of this type of tuberculosis which has made the name of Alton familiar throughout the English-speaking world. Sir HENRY GAUVAIN satisfied himself, and slowly but surely convinced medical opinion, that a rigid conservative treatment under open-air hospital conditions, combined with aspiration of abscesses should they occur, could be trusted to prevent the secondary infections which had constituted the chief dangers to life and limb. The methods he applied having become orthodox, beds have been provided for these bone and joint cases in most parts of the country, and the supply is now becoming adequate to meet fully the demand. Since 1920, therefore, the scope of the work at Alton has widened; many gland cases and severe cases of lupus have been admitted, the light department being reorganised and equipped to provide for their efficient treatment. Plastic operations on healed cases of lupus are performed when needed by Sir HAROLD GILLIES and Mr. T. P. KILNER. During last year 167 children received general carbon-arc light baths for a total of 12,600 hours, and other forms of radiation accounted for another 6000 hours. To these abundant exposures Mr. DUKE-ELDER is inclined to attribute the remarkable immunity of the Alton children from tuberculous infections of the eye. The marine branch of the hospital was opened at Hayling Island in 1919, to offer the stimulus of climatic change and new environment to patients who flagged and needed the tonic of seaside conditions; 223 patients were transferred there from Alton during the year. Combined balneotherapy and heliotherapy is here freely employed. Lastly came the appeal to open the gates of the hospital to all types of crippled children.

A recent school census taken in Portsmouth revealed the fact that there were in the town nearly 500 cases of crippling, many of a severe type, for which no institutional treatment was available. Appeal was made to Alton which, with the approval of the Ministry of Health, decided to take the plunge. An orthopædic clinic was established at Portsmouth, and 55 beds reserved at Alton to serve its needs. Within three years, Sir HENRY tells us, the waiting-list was exhausted, and now any crippled child in the town can obtain immediate admission if need be. A network of other clinics which has long been growing up in the county of Hants is now to be served from the hospital, and Southampton has asked to come into the scheme. The work has required the appointment of an assistant to Mr. H. A. T. FAIRBANK, who has been consulting orthopædic surgeon since 1924. It has also stimulated the educational function of the hospital, for many orthopædic cases return again and again for treatment, and their schooling must go on in hospital if there is to be any continuity of teaching. Incapacitated bodily, the invalid child is often more patient and more eager to learn than the whole one; the handwork, in which even dull and backward children can share, has reached a high level at Alton. In the Hayling branch the children keep weather and tide charts, and get to know the conditions of sea life. The residential college attached to the hospital has turned out over 500 crippled lads trained to trades at which they can earn a livelihood after leaving, especially the making of all kinds of surgical boots and appliances. Uniforms for nurses and maids, as well as their own suits, are made by these boys in the tailors' shop. No wonder that this many-sided work has fired the imagination of the charitable public, and that last year at least 200 local associations contributed £50 or more to its upkeep, while legacies and memorial gifts amounted to £20,000. The work is national in character and patients are eligible for admission from any part of the British Empire. Medical men interested in the work are welcomed and the intensive post-graduate classes held annually are largely attended.

The new buildings which mark the Treloar Hospital's coming of age will enable the work to be done with greater efficiency and economy. We summarise their character on another page. Some may regret the passing of the old timber structures with their wholesome lesson that pioneer work needs no costly outfit; it was in the workshop at Alton that the first non-inflammable celluloid splints were manufactured, and all the apparatus for fixation and extension is of the simplest kind. No one who has visited Hayling Island can fail to have been struck by the coke braziers to warm

the bathers on the shingle and the wattle hurdles to break the wind. But the maintenance of wooden wards is uneconomical, and the layout of the new scheme with a terrace nearly 1000 feet long, on which all the ward-units directly give, will reduce to a minimum the fruitless pushing and pulling and carrying which at present occupy so much of the personnel. Behind, each ward-unit is connected by a covered way with the treatment block, the plaster room, and other specialised units. When complete the Treloar Hospital will have a material framework worthy of the character and spirit of the work carried on within it.

THE PROGRESS OF RADIOLOGY.

THE presidential address to the Electro-Therapeutic Section of the Royal Society of Medicine was delivered last week by Dr. J. M. WOODBURN MORISON, lately in charge of the radiological department at the Edinburgh Royal Infirmary, and now occupying the new chair of radiology in London University tenable at the Cancer Hospital. At the outset Prof. MORISON defined radiology as the science and art of radium rays, X rays, and other electro-magnetic waves, the application of which to the relief of suffering humanity is one of the fundamental problems in medicine. Although in the early days the status of the radiologist was little more than that of a photographer, he is, in fact, a practitioner of medicine, first and foremost a physician; he must seek for truth, holding his theories lightly. Prof. MORISON accorded a word of praise to the manufacturers for designing apparatus of great power and precision; he put to them two further objects of desire—namely, shock-proof apparatus and non-inflammable films. In the very precision of their wares he saw a danger, for almost any intelligent person could be taught to utilise these machines or supervise their working, which induced a tendency to forget that in the diagnosis and treatment of disease by radiological methods a knowledge of medicine and a special training in radiology are alike essential. Paradoxically the existence of the X ray therapeutic department of a hospital could, he said, be justified by its failures. The physician had to consider the cure of the whole man; if only the disease as named were considered, the treatment might indeed be a failure, but it was different when the whole case was reviewed. Inoperable advanced cases of malignant disease were guided and cared for through a long and trying period, the life of the patient was made easier and brighter, the pathway more smooth.

From these major premisses Prof. MORISON was led on to make four points in the relation of radiology to malignant disease. In the first place the public is intensely interested. It is a generous and enlightened public, but he deprecated the tendency in recent books to take too optimistic a view of present achievement, and to give the public the impression that radium is a cure for cancer. Tell the public, he said, the truth about radium so far as it is known, and the better it will be for everyone, even if disappointment is inevitable. His second point was that there is no cause for alarm in the increased number of deaths from cancer, for three-fourths of the increase is due to ageing of the population leading to greater numbers being alive at the cancer age; it should provoke thought when the available statistics show no evidence that treatment by surgery has in any way affected the death-rate from cancer. His third point was that the Radium Commission does not regard the question of radium and cancer as one which is settled. It is rather one which calls for careful inquiry and research under the guidance of the leaders of the medical profession who, by virtue of their position as teachers and research workers, are best qualified to give judgment. The present position in this country is, he said, full of interest and risk; for while it is dangerous for anyone without adequate training to attempt major surgery, it is just as dangerous for anyone without adequate training to use radium. To point the lesson he read extracts from the letter of a distinguished continental radiologist who wrote: "Each day has brought us one of your compatriots, eager to learn. Some of them stay here a fortnight, take notes, and depart, believing in all good faith that they have grasped all we do and how we do it." Thorough training, then, in radiology is essential (the lecturer's fourth point) for those who are going to use radium or to advise others regarding its use. Methods come and go, and come again. For the moment, said Prof. MORISON, we are back again to surface application. The trend of radium therapy on the continent was to avoid wherever possible the introduction of needles and tubes into the tissues, and to develop the surface applicator by distributing it so as to produce a uniform radiation on the skin surface. The work at Brussels on recording the radiation in terms of energy absorption promised well, for it is only the radiation which is actually absorbed that can be causing changes in the tissues. Whether the biological changes are in direct proportion to the energy absorption remains as yet undecided. The bright spot in radium treatment of malignant diseases is in cancer of the cervix, but radium therapy has not yet replaced the use of the knife in the treatment of cancer. The last eleven words are a quotation from an unnamed writer. It may, said Prof. MORISON, never do so, although it is a useful auxiliary capable of alleviating distressing symptoms and of prolonging life.

The close of the address was devoted to the status of the radiologist which in this country Prof. MORISON regards as far from satisfactory. The radiologist is in charge of one of the most important sections of hospital work, but often he lacks full authority. He is expected to treat cases, but is not given charge of beds, and too often he is not considered to be on an equality with other members of the staff. "I look forward," he said, "to the day when every radiologist who has cases to treat will have charge of beds in the hospital. For the benefit of the patient and for the true advancement of radiology this is a necessity." There are signs that the day he looks for is coming.

ANNOTATIONS

DRUG ADDICTION IN AMERICA.

THE public health service of the United States has estimated that there are about 110,000 drug addicts in that country, or approximately 1 in every 1000 of the population, but it is, of course, impossible to know the actual number. Dr. W. L. Treadway, assistant surgeon-general to the service,[1] thinks that any estimate above 200,000 is beyond reasonable probability, and that there is much tendency to exaggerate. At any rate, during the last three years 11,697 persons were committed from the continental United States to Federal prisons for violation of the Federal narcotic laws; 10 per cent. of them were women. The offenders come from every grade of society, but it has been estimated that 80 per cent. belong to the unemployed underworld, and that 20 per cent. have served five or more terms in prison for other offences unconnected with their addiction. The proportion of yellow races is high—about 30 per cent.—and these usually smoke opium. A large number of the women are prostitutes. Few of the cases are under 20 or over 40 years of age, and there is some reason to suppose that new young addicts are not being made as abundantly as in the past. The average age among 1660 individuals was 38. Some of them were earning their living lawfully, but the majority tend to increase their doses, become unsteady, irregularly employed, and migrant. Most of the drug-taking is in large centres of population. More than half the accused persons had had a common school education; 15 per cent. were nearly or quite illiterate; and another 15 per cent. had had a high-school education. Only 0·06 per cent. had had professional training. As a general rule, Dr. Treadway says, alcoholic drunkenness was not associated with drug addiction, and 936 out of 1317 male addicts reported were total abstainers; only eight took alcohol in excess. The drug of choice was morphine or heroin, more often given hypodermically or intravenously than by inhalation. The precipitating causes attributed are interesting: medical treatment, 285; self-treatment for pain, 212; influence of other addicts, 594; curiosity, thrill or bravado, 112.

AMENTIA.

A VALUABLE collection of records and publications on Amentia has been presented to the Library of the Royal College of Surgeons of England by Dr. Thomas Brushfield, who was formerly in charge of the Fountain Hospital for Imbeciles at Tooting, under the Metropolitan Asylums Board. The records comprise the detailed histories which Dr. Brushfield compiled of all the children who came under his charge, from his appointment in 1914 till his retirement in 1927, with photographs of the children taken on admission and after treatment. The histories are classified by the types of amentia—mongolism, cretinism, microcephaly, &c.—and Dr. Brushfield has preserved elaborate details, not only of each child's physical condition and family history, but of the mental tests employed in each case and of the progress of such as were fit to attend school. All these records are fully indexed and numerous tables have been drawn up summarising and analysing the material from various aspects. These histories and statistics, covering so considerable a period from the time when the particular study of mentally deficient children was only beginning, are in many ways unique. He has presented them to the College library so that they may be readily accessible for any research worker in this subject, and he has also presented his large collection of papers and cuttings on amentia, gathered from all over the world. These will be kept together in connexion with Dr. Brushfield's own records, and the donor has prepared a full index to them. The papers cover not merely the varieties of amentia, but other subjects that may have a bearing on it, and there are numerous entries in the index under such headings as Birth, Encephalitis, Endocrines, and Skulls. To complete the usefulness of the collection, Dr. Brushfield has compiled a bibliography of books and articles issued up to the present on all the subjects covered by his index, of which there is no copy in his collection. He further very generously proposes to keep this bibliography up to date, and to incorporate into the collection whatever publications he may continue to collect.

[1] British Journal of Inebriety, October, 1930, p. 50.

CERTIFICATION OF THE BLIND.

THE first regional clinic for certification of the blind was established in September of last year, and serves a population of 2,800,000 in Glasgow and S.W. Scotland. In his annual report Dr. A. S. M. Macgregor describes the first four months' work of the clinic and the sequence of events which led to its formation. The Blind Persons Act of 1920, designed to provide special education and financial and other help to those suffering from major defects of vision, defined a blind person as "a person too blind to perform any work for which eyesight is essential." This definition was variously interpreted by the examiners of the voluntary societies which look after the blind. The need of a uniform standard for admission to a register of blind persons was soon realised. The Mission to the Outdoor Blind for Glasgow and the south-west of Scotland, under the guidance of Dr. A. Freeland Fergus, appointed a competent ophthalmologist in 1925. Other Scottish voluntary societies for the blind followed suit. The next step was the combination of Glasgow with the burghs and counties of south-west Scotland to form a special joint committee to administer the Act. This joint committee, on the recommendation of a report in 1926 by Dr. Fergus and Dr. J. L. Halliday, decided to open a certification clinic.

The clinic is located in Glasgow municipal buildings, and has a staff of four ophthalmic surgeons. Each applicant for certification is introduced through a voluntary society. The candidate is examined by two surgeons independently, who confer as to the decision. The standard of blindness adopted is based on the numerical standard of visual acuity issued in a Government circular for England in 1926 and for Scotland in 1928. In practice it is found, however, that other considerations, such as the general bearing and behaviour of the applicant, including tests to outwit a malingerer, are very necessary. Applicants suspected of malingering or those on the border line are referred for re-examination after from one to six months. The clinic exists only for certification, but the applicant is recommended where to go for the treatment which he needs. A home teacher of the voluntary agency introducing the patient is

present at each session in order to secure the follow-up of candidates who are referred for treatment. The Department of Health for Scotland insists that every applicant for a pension in this area should be certified at the clinic, opportunity being afforded for appeal against an adverse decision. Arrangements are made for home visitation by the ophthalmic surgeon of applicants unable to attend. There are 3000 names on the registers of the voluntary societies in the area. It is anticipated that ultimately this clinic will become the centre for certifying cases of blindness at all ages and for all purposes.

During the first four months, 316 applicants were examined at the clinic and 23 at their homes. Half of the 339 were certified as blind; 74 per cent. of the candidates were over 50 years of age, and males outnumbered females in the proportion of 10 to 7. Half the applicants were Glasgow residents. Treatment recommendations were made for 29 of the 170 certified, including 14 who required the extraction of a cataract. Treatment recommendations were also made for 71 of the 169 refused. In the report by Dr. Fergus and Dr. Halliday (1926) it was estimated that 17 per cent. of cases of blindness in Glasgow were due to venereal disease, and among the 339 first applicants at the clinic it was found that 18·2 per cent. had lost their vision as a result of venereal disease. The majority of the present applicants to the clinic are candidates for pensions, but it is intended by degrees to re-examine all the 3000 blind persons on the registers. The proportion of blind persons registered in south-west Scotland is, it seems, somewhat lower than in England and Wales.[1]

SNAKE VENOM IN EPILEPSY.

THERE are several cases on record where a single snake-bite is said to have caused a permanent arrest of fits in an epileptic. It is not surprising therefore that attempts have been made from time to time to establish a snake-venom therapy in epilepsy. Crotalin, prepared from the venom of the American rattlesnake, was used as early as 1910 in America and reported on favourably by R. H. Spangler, of Philadelphia. As a result, crotalin was tried rather extensively in the States with varying success until 1915, when a comprehensive paper by D. A. Thom claimed to show that the evidence of its usefulness was negligible, and that the preparation then in use was not always free from septic organisms. After Thom's paper the popularity of crotalin seems to have waned, although in 1927 Spangler was still using it for non-specific desensitisation in epilepsy, controlling the dosage by the degree of eosinophilia. Another snake serum known as contra-toxin had some vogue in this country for a short time owing to the claim made by Dr. F. Mehnarto that, by combining one type of reptilian plasma which produced hæmolysis with another type which produced agglutination, he could obtain a serum which produced a lytic action on various micro-organisms. This Mehnarto serum was in fact tried in London just before the war with some apparent benefit in cases of tuberculosis owing, one may suppose, to its non-specific action in producing protein shock. For many years a good deal of scientific work on snakes and snake venoms has been going on at the Port Elizabeth Museum and Snake Park, South Africa. The main object and outcome of such work has, naturally enough, been the treatment of the various snake-bites. But the director, Mr. F. W. FitzSimons, believes that snake venom may have a wider therapeutic value. The preparation that he has called venene is a blending of venoms from different species of snake, and is collected by a method which is said to make septic contamination impossible. This preparation has been widely used for epilepsy in South Africa, and encouraging results were reported by Mr. FitzSimons in a paper read before a combined meeting of the British and South African Associations for the Advancement of Science in July of last year. Epilepsy cures that have had their day and ceased to be are so many that anyone with knowledge of the disease is justifiably cautious—and sometimes, it may be, unjustifiably sceptical. There certainly seems to be a prima-facie case for investigation of the claims put forward for venene. Mackenzie Wallis, W. D. Nichol, and M. Craig,[1] and others have suggested the presence of an allergic element in a certain proportion of cases of epilepsy. Such benefit as has resulted from venom treatment may well have been due to desensitisation.

[1] See THE LANCET, 1930, i., 1023.

CHARLES MAITLAND.

IN spite of the fact that he raised a storm of abuse in his own day, Charles Maitland, pioneer of inoculation for small-pox, has suffered the neglect of succeeding generations. A pamphlet giving a short account of his work has recently been published by his compatriot, John Malcolm Bulloch, at Aberdeen. Maitland was a native of Methlick, and was educated at Marischal College; he was born in 1668 and died at Aberdeen at the age of 80. The first British subject to receive inoculation against small-pox was Edward Wortley Montagu, son of Lady Mary Wortley Montagu, and the operation was performed by Maitland at Pera in 1717. The reason for the appearance of Maitland at Constantinople is unknown, though he may have gone there to investigate this very method of inoculation. Lady Mary had a high opinion of small-pox inoculation, for she suffered her four-year-old son to receive the lymph in one arm from an old Greek woman with a blunt and rusty needle, and later from Maitland, in the other arm, with so much better practice that he assures us the boy did "not complain." On his return to England in 1718, Maitland received permission to inoculate six condemned prisoners at Newgate in return for remittance of their sentence. He seems to have been well satisfied with his experiment, for the apothecary of Christ's Hospital, Isaac Massey, reports him as being "as confident and positive of success . . . as if he had had 20 years' experience without any miscarriage"—a description which reflects the immutability, or otherwise, of science. Later in the year he inoculated several persons in Hertfordshire, and in the following year published an account of his work which earned him hearty condemnation from all quarters, not excluding that of the medical profession. A sermon "against the danger and sinful practice of inoculation" was preached by the Rev. Edmund Massey. The apothecary, Isaac Massey, however, was Maitland's supporter, and wrote a pamphlet to vindicate him, and four other pamphlets in his favour were produced by Dr. James Jurin, physician at Guy's Hospital. In 1724 the King sent Maitland to Hanover to inoculate his grandson Prince Frederick Lewis, afterwards Prince of Wales. Maitland had an anxious time supervising the care of the prince during the eruption, regulating his diet, and counting the spots, of which he assures us there were "above 500." The appearance of the pustules evidently was not without

[1] THE LANCET, 1923, i., 741.

serious possibilities, for Maitland says fervently: "But, thank God, his eyes are perfectly free of them." The prince did very well, and lived to goad his father into the remark: "My dear first-born is the greatest ass and the greatest liar and the greatest canaille in the whole world, and I heartily wish he was out of it." For this royal inoculation Maitland was paid £1000, but though his success was considerable in Germany he was received with renewed opposition on his return to England. In 1726 he repaired to Scotland; here he seems to have been unfortunate, for he inoculated a child "labouring under a hydrocephalus" of which he had not been informed, and the result was fatal. In 1727 he is mentioned as inoculating cases in London, but from that time onwards Mr. Bulloch can find no account of his work. He died at Aberdeen in 1748, leaving the sum of £333 6*s*. 8*d*. to the poor of his native parish. As an enthusiastic and courageous experimenter he deserves to escape from that oblivion from which Mr. Bulloch has rescued him.

EIDETIC IMAGERY.

WHILE the work of Prof. E. R. Jaensch is well known to psychologists and educationalists, it is perhaps too little known to physicians, at least in this country. An excellent translation recently published [1] leaves no excuse for ignorance of a subject as important as it is interesting. Prof. Jaensch and his brother believe that they have established experimentally the existence of optical perceptual or eidetic images which take up an intermediate position between sensations and images. "Like ordinary physiological after-images, they are always *seen* in the literal sense. They have this property of necessity, and under all conditions, and share it with sensations." Their character is, of course, fluctuant and according to personality they are nearer to, or remote from, both after-images and memory images at either extreme. The conditions under which these images are seen is somewhat peculiar. First, as is natural, the subject (the "eidetic" is usually a young subject) must clearly understand the nature of the experiment and what is meant by seeing—that is, not memorising. Further, the image proper is seen best on a homogeneous dark grey background of 50° white or 210° black cloth on the colour disc. This screen, therefore, is standardised for all experiments. Most interesting fact of all, particularly for medicine, is the experimental discovery that the eidetic phenomenon is closely correlated with the basedowian and tetanoid syndromes, and occurs in persons of a physique found with these syndromes. Fundamentally, however, within the limits of Jaensch's researches, these symptoms are merely normal physiological characteristics of a certain youthful stage of development, and in no way pathological manifestations. Pure types of so-called B. (basedowian) and T. (tetanoid) types are rare even in youthful subjects. The majority of cases are a fusion of both. Experimentally, it is obviously desirable to study the extreme cases. Such a study as Jaensch's has interesting light to throw on reaction types in psychopathology, and illuminates in addition many peculiarities in learning met with by educationists. A still more interesting medico-psychological correlation with the eidetic is the presence of abnormal capillary forms on the nail margins of certain subjects of eidetic imagery—for example, in hypothyroid cretins. Examination of groups of backward children, and children in goitre areas, substantiated this correlation. The author epitomises much of the recent work on these fascinating allied topics and gives us but a glimpse of a subject which promises a fruitful field of research in the realm between general medicine and psychopathology.

[1] Eidetic Imagery and Typological Methods of Investigation. By E. R. Jaensch, Professor of Psychology at the University of Marburg. London: Kegan Paul. 1930. 7*s*. 6*d*.

PHYSIOTHERAPY FOR INDUSTRIAL INJURIES.

THE severity of an industrial injury cannot be assessed by considering the initial lesion alone. The rate of healing and the final disability are of much importance to the parties concerned—to the worker himself, to the employer who suffers from disorganisation of his industry by loss of skilled labour, and to the insurance company which bears the financial burden. Rapid recovery and a good functional result are of the greatest possible importance, and it is somewhat surprising that no more systematic procedure is in vogue for the management of injuries in industry. In the United States certain insurance companies have established centres for their treatment, and have found that the initial outlay and the cost of upkeep have been justified, and a recent report by Dr. Paul Lemariée,[1] surgeon to the Michelin works, will repay study by those interested in the possibilities of physiotherapy. Situated beside the first-aid and surgical treatment centres of the Michelin works there is, he says, a well-equipped department containing apparatus for diathermy, ultra-violet and infra-red irradiation, with apparatus for active and passive re-education of function, and an X ray installation. This department works in close coöperation with the surgeons, and the results have been found very satisfactory. Lemariée reports in some detail on the treatment of some 4000 cases of burns and wounds of varying severity, and his observations on the ultra-violet treatment of burns and scalds support the favourable opinion held by other workers in actinotherapy; for it is claimed that the method prevents contractures, leaves a supple scar, and brings early restoration of function. The improvement obtained by coöperation of casualty and surgical departments with a department of physiotherapy is generally recognised in this country, but suitable facilities for special methods of treatment are not always available for, or sought by, the victims of industrial accidents. It is clear that a situation of this kind demands the coöperation of the interested parties.

DIGITALIS IN PNEUMONIA.

OPINION still differs about the use of digitalis in pneumonia, and attempts have lately been made to settle the question both experimentally and clinically. Last April Prof. W. E. Dixon and Dr. G. N. Myers reported to the Royal Society of Medicine [2] on the value of the drug in the comparable toxæmia produced in animals by injection of diphtheria toxin—which was chosen because the dose could be accurately measured. It was found that 1/350th of a cubic centimetre killed 95 per cent. of the guinea-pigs. If, however, a reliable tincture of digitalis had previously been given, the animals nearly always survived three times this dose, and the same effect was observed if the toxin was given first, provided the digitalis was not long delayed. Strophanthus had the same effect as digitalis, except that it needed to

[1] Paris Méd., August 23rd, p. 161.
[2] See THE LANCET, 1930, i., 964.

be given for a longer time beforehand to have any effect on the toxæmia. Dixon and Myers suggested that digitalis, in taking time to act, occupied a part of the cardiac structure to which the toxin normally attached itself, and thus made the latter innocuous; and the inference seemed to be that the drug was definitely helpful. W. L. Niles and J. Wyckoff,[3] on the other hand, provide opposing evidence from a clinical study of 404 cases of lobar pneumonia. Alternate cases were given digitalis, and in all cases electrocardiograms were taken daily during the febrile period and on alternate days afterwards. The dosage was never more than 0·15 cat units per pound of body-weight, and the drug was stopped immediately if toxic symptoms were observed. During the first year of the investigation the digitalising dose was given at six-hourly intervals over a period of 24 hours, but owing to the frequent incidence of toxic symptoms the quantity taken was reduced by nearly half during the second year. The results appear to be anything but favourable to digitalis, for in every group the mortality seems to have been higher with its use. In the whole group there were 33 cases of auricular fibrillation and flutter, and 16 of them were treated with digitalis; 14 of these died, whereas there were only 9 deaths among the 17 who did not have digitalis. The experimental and clinical evidence thus appear to be in conflict, but it must be remembered that the condition under which experimental digitalis therapy was efficient was that the drug was given before or very soon after the toxin—a relationship very rare in practice. Furthermore, it is possible that better results might be attained by greater clinical discrimination than is possible when alternate cases have to be treated, for purposes of investigation, by a particular method.

[3] Amer. Jour. Med. Sci., Sept., 1930, p. 348.

FIRST-AID ON THE FRENCH ROADS.

THE organisation of help to those who fall by the way in this age of fast-moving traffic is being taken up in other countries. On Oct. 13th Mr. Léon Auscher, President of the Union Nationale des Associations de Tourisme, and Dr. Pierre Béhague, President of the Commission de Secours Médico-Chirurgicaux et de Protection aux Blessés de la Route du Touring-Club de France, gave a lecture and demonstration on first-aid on the French roads to an international gathering of experts in this field. In the course of only 18 months Auscher and Béhague have covered the map of France with between one and two thousand first-aid posts whose presence is indicated by the Geneva Red Cross emblem placed in a prominent position at an average of every five kilometres on many of the main roads. This rapidly growing organisation is served by a central office with a staff of only five persons, of whom only the three most subordinate receive a salary. When some point on a main road begins to become notorious for accidents, an inspector proceeds to it and then goes to the nearest homestead in search of an occupant whose vocation keeps him at home day and night. Arrangements are made with this person to house the first-aid equipment and to undertake the necessary duties in case of accidents. A small fee is provided, so that the time spent by this person in attending to the victims of an accident does not represent a dead loss to him. The outfit which he uses up on such an occasion is replaced by the central office within 24 hours. To meet the expenses of the Red Cross sign-boards, a small space is reserved at the bottom of them for the name of that commercial undertaking which has financed them; and the expenses of the first-aid telephones are met, to some extent, by their being made available to persons other than those using them for first-aid purposes. Dr. Béhague demonstrated some interesting tables showing the relative frequency of road accidents on different days of the week and at different hours of the day. Sunday shows the highest peak, and Monday also, being part of the week-end or *semaine anglaise*, is a bad day for accidents. So is Wednesday, which is often a market day. The distribution of road accidents in the several hours of the day showed how important is the rôle played by meals, including liquid nourishment, in the accidents which overtake the motorist and his victims.

A DEMONSTRATION IN CHILD HEALTH MEASURES.

FORTY southern communities in the United States applied for a demonstration in child health measures when this was offered by the Commonwealth Fund, and the choice fell upon Athens, the county seat of Clarke County, Georgia, and its environs, an area of 24,000 inhabitants. More than half the residents are white mill-hands and poverty-stricken negroes. A public health programme had been initiated by the health officer in 1920, but before the beginning of the demonstration in 1924 there had been no accepted plan, and no coördination of health services. The report of the Fund [1] describes the institution of a comprehensive scheme based on three aims: to increase the service of the health department in its familiar fields; to establish health supervision of children from the prenatal period through the school years; and to educate mothers, children, and the community generally in healthy living. One of the most important innovations under the scheme was the introduction of five nurses and a supervisor to supplement the work of the health department. Previously there had been one nurse who was quite unable to cope with the work devolving on her. The laboratory service was also improved by the appointment of a full-time bacteriologist and the introduction of modern equipment. Control of communicable diseases became much more efficient as the result of better supervision, and daily visits to the schools by the nurse. Health records were kept by the teacher and were handed to the doctor at the time of medical inspections. Vision and hearing tests were held at the beginning of the school year, and the importance of dental treatment was emphasised by various devices, one plan being to offer a holiday for classes which had secured 100 per cent. correction of dental defects. An oral hygienist visited the schools and demonstrated on the care of the teeth, at the same time referring to a dentist those children who showed dental defects. Health teaching was introduced into the school curriculum for ten minutes at the beginning of the day; milk lunches and even midday meals were provided in some schools, but the negro children were often so poor that they could not afford the small cost asked. Improvements in lighting and ventilation were made in the classrooms wherever possible. For the care of infants and young children several welfare centres were opened of which eight were active at the end of the demonstration; the infant mortality was found

[1] A Chapter of Child Health. Report of the Commonwealth Fund Child Health Demonstration in Clarke County and Athens, Georgia, 1924–28. New York: Commonwealth Fund Division of Publications. 1930. Pp. 169. 81.

to be decidedly less among children attending the centres than among the general population. Supervision and instruction was instituted among negro midwives, many of whom had had no previous training, and the value of antenatal medical attention was stressed as much as possible, with good results. During the four years 1920–23 the deaths of 372 children were recorded; the deaths during the period of the demonstration fell short of this number by 124, and though it is impossible to draw definite conclusions from such figures it seems probable that the health campaign played a part in the reduction. Since the end of the demonstration a ruthless demand for economy has cut down the additions to the health service so thoroughly that only the full-time laboratory service and three nurses in place of one remain as an improvement of the original position. Apparently, although public health may be purchasable, Athens and Clarke County have concluded that its price is too high.

PROPOSED NEW FORMULÆ FOR THE B.P.

A Pharmacy Subcommittee of the Pharmacopœia Commission was formed in September, 1929, and has now issued its first report,[1] which incorporates suggestions for some new formulæ. An important economy would be effected by the permission to use industrial methylated spirit in making solid extracts and certain other preparations, subject to the regulations of the Board of Customs and Excise. For example, among the new formulæ set out in the report the use of industrial methylated spirit is suggested in the preparation of extractum belladonnæ siccum, extractum cinchonæ, extractum colchici siccum, fel bovinum purificatum (in future to be known as extractum fellis bovini), linimentum and emplastrum belladonnæ, liquor picis carbonis, and certain resins. Another economy is proposed in the replacement of olive oil by cotton-seed oil in certain preparations, such as unguentum hydrargyri compositum, and in linimentum camphoræ, since a high-grade olive oil will be described in the Pharmacopœia. In parts of the Empire outside the British Isles the use of arachis oil or sesame oil will be permitted. The subcommittee recommend that for convenience in manufacture the quantities in the formulæ for glycerins should be expressed in weight. The error involved in measuring glycerin would thus be avoided. They also recommend the inclusion in the Pharmacopœia of concentrated preparations which, when diluted with seven times their volume of distilled water, will be equivalent in strength, if not in flavour, to fresh infusions. Practitioners who prefer fresh infusions would be able to ensure that these will be dispensed by adding the word "recens" to the name of the infusion. Digitalis should be dispensed only in fresh infusion. In response to the suggestion that lard and benzoated lard should be replaced as far as possible by a base not liable to develop rancidity, experiments have been made with mixtures of paraffin and various fats, with the result that a formula has been devised under the name of unguentum simplex. This consists of wool fat (1 part), hard paraffin (2 parts), and soft paraffin (17 parts), and could be used for certain of the official ointments which are now made with lard. Since an international agreement requires that the name "tincture" shall not be given to simple solutions of chemical substances, the two tinctures of iodine official in the B.P. 1914 should be renamed and classed as solutions, the present names being retained as synonyms. We can confirm the conclusion of the subcommittee that an official preparation corresponding to the "French tincture of iodine" is required; they propose that the need would be met by a 10 per cent. w/v solution of iodine in alcohol (95 per cent.), which might be named liquor iodi simplex. A preliminary survey of the report does not suggest that the criticisms which are invited in cordial terms will be drastic. We are assured that careful consideration will be given to all opinions evoked by the report, and recommend physicians to study it with attention.

[1] Pharmacopœia Commission. Reports of Subcommittees. I. Report of Pharmacy Subcommittee, August, 1930. Published by authority of the General Medical Council. London: 44, Hallam-street, W. Pp. 35. 1s.

PATHOLOGY OF THE PERIPHERAL CIRCULATION.

STARR[1] reports that he has used the histamine reaction to investigate the state of the circulation of the feet in pathological conditions. Three of 11 cases of arterio-sclerosis with hypertension showed a deficient circulation, as also did two more after the onset of cardiac failure. These results suggest that an increase in the systemic blood pressure may compensate an impairment of the circulation due to arterio-sclerosis. In cardiac failure the reaction may be within normal limits even in the presence of œdema, and it is not until other signs of failure are well marked that the reaction becomes definitely abnormal. The investigation of cases with a lesion of the peripheral nerves confirmed Lewis's conclusions that the flare is nervous in origin, these cases developing a well-marked wheal but no flare. In diabetes mellitus the reaction enables one to assess the degree to which the arterio-sclerosis of the main vessels has been compensated by a rise in blood pressure or by the opening up of anastomotic channels. The reaction responded fairly rapidly to alterations in the general condition of the patient and also to improvement with treatment. It is also suggested that the reaction should be of value in deciding the level at which amputation should be performed in cases of gangrene.

[1] Starr, I., jun.: Amer. Jour. Med. Sci., August, 1930.

THE annual dinner of the Royal Society of Medicine will be held at the Mayfair Hotel on Thursday, Nov. 20th, at 7.30 for 8 P.M. The Duke of York will attend the dinner, and the Bishop of Birmingham and Sir John Simon will be present as guests of honour.

THE Fifth Conference on Maternal Mortality will be held at Friends House, Euston-road, on Oct. 27th, at 2.30 P.M., the Duchess of Atholl presiding. The principal speaker will be the Minister of Health, Mr. Arthur Greenwood. Miss Marion Phillips, D.Sc., and Lady Erleigh will also take part.

AT the opening meeting of the Section of Medicine of the Royal Society of Medicine, to be held at 5 P.M., next Tuesday, Oct. 28th, a discussion on Research in Clinical Medicine will be opened by Dr. J. A. Ryle, physician to Guy's Hospital; Dr. H. Francis Moore, professor of medicine at University College, Dublin; and Dr. Helen M. M. Mackay, late Ernest Hart and Beit Memorial Research Scholar, who will deal briefly with the natural scope and limitations of such research and the measures, if any, which should be taken for its direction and encouragement.

MODERN TECHNIQUE IN TREATMENT

A Series of Special Articles, contributed by invitation.

CCCIX.

TREATMENT OF POSTERIOR POSITIONS OF THE VERTEX.*

IT is well known that posterior positions of the vertex are more common in the antenatal period than at delivery. The following statistics are taken from the "Queen Charlotte's Practice of Obstetrics": "The antenatal department has demonstrated that at the thirty-sixth week of pregnancy a posterior position of the occiput is present in 45 per cent. of vertex cases examined. As labour begins the majority of these positions rotate and are delivered as anterior ones. Out of 18,500 presentations it was found that the posterior position remained so during labour in 363 cases, this being equivalent to 1·95 per cent." By antenatal examination the condition is easily diagnosed, and it is important to make out before labour whether or not the head is well flexed. If the head is low in the pelvis, it is generally safe to assume that it is well flexed. The relative height of the occiput and the frontal pole should be estimated; the lower down the occiput is felt the more complete is the flexion of the head.

Two types of cases tend to have a posterior position of the occiput: (1) those in which there is a mild degree of pelvic contraction or a relatively rather large head, and (2) those in which the child's head is rather small and lying low in the pelvic cavity. Cases where the child's head is small and very low at the onset of labour are apt to lead to a long labour, though rotation often occurs late in the second stage.

Measures During the Antenatal Period.

When the head is high and badly flexed the apparent disproportion is greater than the real disproportion. It is often found that during the week before term the flexion of the head improves, and then it will be found to engage satisfactorily. It is advisable to make a vaginal examination in the antenatal period in order to exclude the possibility of an abnormal pelvis, and also to gauge as accurately as possible the size of the pelvis.

In my experience, efforts to rotate the child manually per abdomen and per vaginam have proved unsuccessful, but in a number of cases the following method of treatment has been successful in causing rotation to an anterior position before the onset of labour, and at the same time flexion of the head. During the last four weeks of pregnancy the patient is given a fairly tight elastic belt to wear day and night. A thick pad—the length of the pad being the width of the belt—is applied over the side of the uterus, well out over the back of the child, and the belt put on over this. The pad should be about nine inches long and four inches in diameter. It can be made of cotton-wool wrapped in a piece of soft linen, or it can be made by folding a soft face towel and putting a few stitches in so as to keep it the correct size. In an L.O.P. the pad should be applied on the left side of the mother's abdomen. This causes very little inconvenience to the patient, and it is successful in a fair number of cases in causing rotation to an anterior position.

* An article in this series by Miss Dearnley on the Treatment of Breech Presentations appeared in THE LANCET of Sept. 27th.

Measures During Labour.

Unless adequate abdominal palpation is practised early in labour, it is very easy to miss the presence of a posterior position. In every case of labour with a long first or second stage, this complication should be thought of. A vaginal examination will usually clear up the diagnosis easily. If necessary, it is well worth while to give an anæsthetic in order to be able to make a thorough examination of the abdomen and vagina, and so to arrive at a correct diagnosis. In a primigravida a posterior position of the vertex is a trying complication, since it inevitably means a long labour. The first stage is generally tedious—sometimes lasting for several days. The labour pains often occur with great frequency, and seem to be more painful to the patient than in normal labour. The dilatation of the cervix tends to be very slow, and early rupture of the membranes is not uncommon. On vaginal examination early in labour it is often impossible to make out anything very definite beyond the fact that there is an elongated bag of membranes, and that the presenting part is high up. When an examination is made later in labour and the head is lower it is important to make out the position of the anterior and posterior fontanelles. When both fontanelles can be felt the diagnosis of a posterior position is certain. When the anterior fontanelle alone can be felt, then the case is likely to be one in which interference will be necessary.

Since a long first stage is to be anticipated, the possible exhaustion of the patient should be foreseen, and all measures should be taken to conserve her strength. It is very well worth while to give her plenty of analgesics in the first stage of labour, so that when the second stage begins she is not already worn out. Hypodermic injections of morphia gr. ¼ are useful, and there is no objection to repeating morphia gr. ¼, or combining with it hyoscine gr. 1/150. In addition to morphia it is often useful to give pot. brom. grs. 20 and chloral hydrate grs. 20, and this last mixture can be repeated as required. To aid rotation the patient is told to lie on the side opposite to that on which the back of the child is situated.

It is of the greatest importance not to interfere in any more active way until full dilatation of the cervix has been accomplished. Many disasters occur from neglect of this fundamental rule. It is often difficult to avoid interfering too early, as the patience of all concerned is much tried, but knowledge of the bad results which follow the application of forceps before full dilatation should be an effective deterrent. If the mother is not too exhausted at the beginning of the second stage, there is much to be gained by allowing the labour to continue undisturbed. If the head is descending at this time, it is an indication that rotation is occurring, and if there is no fœtal distress, and time is allowed, the child will most probably be born naturally as an anterior vertex.

At the beginning of the second stage it is an advantage to let the patient lie on her back with her knees flexed and her feet on the bed. Rotation appears to take place much more easily in this position than when the patient is lying on her side. Since discovering this accidentally, it has been my practice to place the patient in this position in posterior positions of the occiput, often with remarkably good and quick results. The patient is allowed to stay on her back

until the head is crowned, and in some cases until it is born. In other cases the squatting position is assumed for a time, after the beginning of the second stage, with good results.

In a small proportion of cases, where there is no disproportion, and where the uterine forces are good, the child is born spontaneously as a face to pubes. If care is taken, there is no need to get more than a small tear of the perineum, though as the larger occipito-frontal diameter distends the perineum there is greater distension of the perineum than normal, and consequently very great pain. A generous amount of anæsthetic is necessary for the relief of pain and also for the prevention of a tear. If a posterior position is suspected, an anæsthetist should be requisitioned early in the second stage of labour. Plenty of anæsthetic is of great use in the prevention of a tear. The head should not be born during a "pain."

As early rupture of the membranes is common and, in any case, as the labour has been long, it is especially important to be on the look-out for fœtal distress, and to listen to the fœtal heart frequently and to keep a record of the fœtal heart-rate. If there is any indication of fœtal distress in the second stage, it is advisable to be prepared to interfere quickly, and it is a wise precaution to have the forceps boiled and ready at the beginning of the second stage. Often the patient shows signs of exhaustion after a long first stage, and, in consequence, is incapable of bearing down efficiently in the second stage. Moreover, owing to fatigue, the uterine contractions may become less effective. These are definite indications for interference. It is of great advantage to wait until some moulding of the head has occurred, but the best moment for the application of forceps has to be decided on one's experience and good judgment. Each case must be dealt with on its merits. If the fœtal heart is not satisfactory, it can be improved by giving the mother a hypodermic injection of camphor in oil grs. 3 in 1 cc. before the application of forceps. This has an extremely good effect on the fœtal heart and can be repeated if necessary.

Technique of Manual Rotation.

The patient is anæsthetised as for an operation, the bladder is emptied by catheter, and a careful vaginal examination made to ascertain exactly how the head is lying. The head is then turned manually with the whole hand in the vagina. The right hand is used for an L.O.P. and the left hand for an R.O.P. The head is grasped and turned by the hand in the vagina, whilst the shoulder of the child is turned towards the midline by the other hand on the patient's abdomen, on which a sterile towel has been spread.

In some cases it is more effective to pass the hand in the vagina above the head, and grasp the shoulder and turn the shoulder and head by one movement towards the midline. However, in this manœuvre some difficulty may be found in turning the head, and in practically all cases the head is inadvertently pushed up to some extent out of the pelvis. Some authorities advise that after turning the head and shoulder the case should be left to nature; but in my experience there is a very great tendency for the head to rotate backwards again to its original position almost at once. Therefore it is much the safer method, where this amount of interference has been necessary, to put on forceps at once after rotation and deliver straight away. It is important in these cases to remember to put the forceps well up over the head, because the head is nearly always pushed up to some extent, and unless the forceps are applied rather higher than usual there is a tendency for them to slip off as soon as they are pulled on. I have frequently seen this happen, and am convinced that too low an application of the forceps is the chief cause of "slipped forceps" in such cases. In dealing with a right occipito-posterior position, after manual rotation and whilst still having the left hand in the vagina holding the head in position, it is a good plan to apply the right blade of the forceps before the head can slip back, and then to hold the right blade firmly in position whilst applying the left blade. It is of great assistance to have the patient lying on her back in the lithotomy position for rotation and application of forceps in posterior positions of the vertex.

Occasionally the head is so tightly jammed in the pelvis that manual rotation is impossible. In such a case, where no progress is being made, axis-traction forceps can be applied as accurately as possible to the fœtal head. After a few pulls the head rotates to some extent and comes down. The forceps are then taken off and reapplied accurately, and the head delivered as an anterior. In this way the possibility of damage to the child's head is greatly minimised.

It is possible to apply forceps to the head in the posterior position, and to deliver the child successfully in this position; but there is a great risk of damage to the head, and it is, moreover, almost impossible to avoid a bad tear of the perineum. Rotation of the head forcibly after application of forceps is very dangerous and is a practice to be condemned.

When the case is seen late in labour for the first time and the child is dead perforation is the correct treatment.

GERTRUDE DEARNLEY, M.D., B.S. Lond.,
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THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

Surg. Lt.-Comdr. J. C. Brown to be Surg.-Comdr.
Surg. Lt. D. Duncan to be Surg. Lt.-Comdr.

ROYAL ARMY MEDICAL CORPS.

Col. R. B. Ainsworth, late R.A.M.C., to be Comdt. and Dir. of Studies, R.A. Med. Coll.

Lt.-Col. B. G. Patch, having attained the age for compulsory retirement, is placed on retd. pay.

Maj. (temp. Lt.-Col.) W. J. E. Bell to be Lt.-Col., vice Lt.-Col. B. G. Patch.

Maj. J. J. O'Keeffe to be temp. Lt.-Col.

Capt. F. Holmes to be Maj.

Capt. J. M. Pinkerton relinquishes his temp. commn. and is granted the rank of Maj.

ARMY RESERVE OF OFFICERS.

Capt. D. V. M. Adams, having attained the age limit of liability to recall, ceases to belong to the Res. of Off.

Lt. C. Wroth, from Reg. Army Res. of Off., R.A., to be Lt., retaining his present seniority.

ARMY DENTAL CORPS.

Capt. S. H. Woods to be Maj.

MILITIA.

Maj. F. L. Tulloch retires on attaining the age limit, and retains the rank of Maj.

TERRITORIAL ARMY.

Lts. H. R. Paterson, E. G. R. Grant, L. P. Marshall, E. J. G. Glass, and H. V. Morlock to be Capts.

J. R. Macdonald (late Offr. Cadet Serjt., Edin. Univ. Contgt., Sen. Div., O.T.C.) to be Lt.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Capt. (Bt. Maj.) J. B. Orr and Capt. W. F. Wilson, having attained the age limit, relinquish their commns. and retain their rank.

The King has approved of the award of the Royal Naval Volunteer Reserve Officers' Decoration to Surg.-Comdr. W. C. Macartney.

SPECIAL ARTICLES

THE BOARD OF CONTROL AND THE MENTAL TREATMENT ACT, 1930.

THE new Mental Treatment Act comes into operation on Jan. 1st next and will bring with it many changes in the law and practice relating to the treatment of mental illness. The Board of Control has circulated a memorandum explaining the Act to local authorities and opportunities which it affords in order that they may consider in advance the steps they will take to meet the new era. The reproach that no public mental hospital could admit a person who applied for treatment is at last gone, but it has taken 30 years or more to remove such a glaring anomaly. The medical profession has urged this for years and will welcome the provision. There are other changes too which closely concern the practitioner in his daily work.

Voluntary Patients.

The first four sections of the Act introduce a new code for voluntary patients, and begin by substituting this term for the old "voluntary boarder." These patients are to be received in future into any institution within the meaning of the Act, so that they will no longer be restricted to registered hospitals and licensed houses. The local authority can fix terms and conditions as to payment in their own institution or can arrange for their voluntary patients to be taken in by an approved hospital or nursing home. They are urged to limit the charge to the lowest possible figure, as early treatment is a fundamentally economic proposition.

The Board explains that the voluntary patients will include two classes: the recent, who enter the institution voluntarily and those who choose to stay on after being released from certificate. Among the voluntary patients of the future, however, there will be an increasing number with symptoms so mild or incipient that they would not in the past have been admissible to mental hospitals. These are the people who are likely to be sensitive to or critical of their surroundings and to suffer if they find themselves among acute or restless cases. For these there should be an admission block where they can be thoroughly examined, and a convalescent block where they can receive ambulatory treatment. The Board urges the provision of these blocks where they are not already available. There is also the important possibility of treating these cases in the local general hospital, and the Board is anxious that local authorities should make contracts to this effect whenever possible, ensuring at the same time that the staff of the mental hospital is concerned in the care of mental patients.

While adult voluntary patients can be received without any formality other than a written application to the medical superintendent, children under 16 can now also be admitted on the application of a parent or guardian, supported by a medical recommendation from the family doctor or an approved practitioner.

The reception and departure or death of voluntary patients are to be notified to the Board. A voluntary patient can leave hospital on 72 hours' notice in writing to the person in charge; in the case of a child the notice is given by the parent or guardian. He must be discharged or certified within 28 days if he becomes and remains incapable of expressing his volition. On general grounds it is undesirable to certify any patient in the institution which he entered voluntarily, and he should be removed if possible. If the parent or guardian of a minor fails to fulfil his duties as such, the Board is to be notified. A Commissioner may visit a voluntary patient at any time and order his discharge or removal unless placed under certificate.

Temporary Patients.

The temporary patient is the person who is "suffering from mental illness and is likely to benefit by temporary treatment, but is for the time being incapable of expressing himself as willing or unwilling to receive such treatment." This is new to English law. Section 5 provides for the treatment of these patients without the certificate which has hitherto been necessary, and the procedure does not involve any magisterial order. The principal document is an application in a prescribed form which must be made, if possible, by the husband or wife or by a relative, or—at their request—by a duly authorised officer of the local authority in the area. If it is made by any other person the reason must be given. Local authorities must authorise officers to act under this section when required. The application is to be supported by a medical recommendation in prescribed form, signed by two doctors, one a practitioner approved by the Board of Control and the other, if possible, the usual medical attendant of the patient. These requirements are important, for they affect the validity of the patient's application. The Act also provides for the examination of the patient and for the lapse of the recommendation after a certain period.

The temporary patient can be received into any public and registered mental hospital or into any licensed house, hospital, or home approved by the Board, or, with its consent into single care. Once again the local authorities will have to consider whether the accommodation at their disposal is suitable for these patients. The Act contemplates the possibility of differentiating them from the certified, although as a class they are people who would in the past have come under certification in many cases.

As soon as the temporary patient is received, notice must be sent to the Board of Control and to the clerk of the Visiting Committee or of the Visitors of Licensed Houses, as the case may be, and similar notice must be sent on departure or death. Temporary patients are to be visited within a month of their reception by two member of the visiting committee or two visitors of licensed houses. The visitors must sign a statement approving the detention of the patient, or else send a report to the Board of Control. This visitation will be undertaken by the Board in the places within its immediate jurisdiction —i.e., within seven miles of London, Westminster, and Southwark. A maximum period of six months is allowed for the treatment of temporary patients, but if recovery seems imminent at the end of that time the period can be extended for further periods not exceeding six months in all by direction of the Board of Control. A temporary patient must be discharged within 28 days if he becomes and remains capable of expressing himself as willing or unwilling to continue treatment. The Board of Control may direct that he be discharged or dealt with under the

principal Act at any time. The estates of temporary patients may receive the protection of the Judge in Lunacy in the same way as do those of certified patients.

It will be possible in future for a large number of acute and recent cases of mental disorder to be treated for recovery without certification. This promises to mean much for many persons and we hope will help to remove the stigma attaching to insanity. Many patients suffering from puerperal or toxic mental disorder will in future be treated to recovery without being formally certified as insane.

Powers and Duties of Local Authorities.

Among the new powers given to local authorities by this Act are those of providing out-patient clinics and after-care; undertaking research, contributing to the funds of voluntary associations formed to prevent and treat mental disorder, and making agreements with other local authorities for coöperation in measures for mental health. The exercise of these powers (except that relating to research) does not require the approval of the Board of Control, but it will be very useful if local authorities making such joint agreements will keep the Board informed. The out-patient clinics can be organised at the mental hospital if desired, but the circular suggests that there are great advantages in arranging it at the general hospital wherever one is accessible. It is important, however, that the medical staff of the mental hospital should be associated with the staff of the general hospital in running the clinic. The Board hopes that they will be informed of arrangements made, and provided with periodic reports of the work carried out. The success of the out-patient clinic must depend on the use made of it by the public, and this calls for propaganda work. Local authorities are urged to consider how best to disseminate information concerning the new facilities available next year. The power to undertake research and contribute financially towards research work in relation to mental illness is subject to the approval of the Board of Control. This provision is designed to obviate overlapping and to ensure the focusing and further development of individual researches. Under the new Act local authorities will have the same powers as to provision, equipment, and maintenance of hospitals, acquisition of land and borrowing of money, and appointment of staffs as they had under the original Act.

Visiting Committees and Supervising Medical Officers.

Every local authority must appoint annually a visiting committee of not less than seven members to exercise the powers conferred by the various Acts, with the exception of the powers of raising a rate or borrowing money. This now applies to every local authority, whether they have a mental hospital or not. This committee can appoint subcommittees as they think fit and, if they have more than one mental hospital under their charge, they must appoint a subcommittee for each. The committee may coöpt persons who are not members of the local authority up to one-third of their total number. The Minister of Health still has the power given him by the Mental Deficiency Act, 1913, to authorise a local authority to appoint their mental deficiency committee to be the visiting committee. Two members of every visiting committee must be women, and one member of every subcommittee appointed for an institution must be a woman. When a separate visiting committee is appointed for an institution under an agreement to unite, one at least of the members appointed by each local authority which appoints three or more members must be a woman.

Local authorities which have two or more mental hospitals may appoint a supervising medical officer to have general supervision over all of them. Each must have a resident medical superintendent in immediate charge, and the supervising officer may be —but need not be— one of the medical superintendents. The relations between the medical officers are to be regulated by the local authority with the approval of the Board of Control. This section is purely permissive.

Board of Control.

The Board of Control is reorganised by this Act and is to consist of a chairman and four senior commissioners. A section of the Act removes a difficulty which has militated against the transfer of officers from the service of local authorities to that of the Board by preserving continuity of services for the purpose of superannuation. Any visitation or other act required or authorised to be carried out by the Board or by a commissioner may, at the discretion of the Board, be carried out by one or more commissioners or one or more inspectors. To avoid central duplication of work, certain powers and duties now vested in the Minister of Health are transferred to the Board. These include the approval of contracts to unite for providing mental hospital accommodation, or contracts made with councils of county boroughs for the reception of rate-aided persons—variations of agreements, plans and estimates, and dissolution of agreements. After Jan. 1st, therefore, local authorities must apply to the Board of Control for approval of their plans and contracts. Application for sanction for borrowing money must, however, be made to the Minister of Health as heretofore.

The Board is empowered to make rules for such matters as books and records to be kept and notices to be sent, and for application of the provisions of the Act to patients and institutions, and for the prescription of evidence required for an extension of the treatment of temporary patients.

In connexion with the approval of practitioners for the purpose of giving recommendations under Sections 1 (2) and 5 (3) of the Act, the Board of Control has appointed a committee of medical men under the chairmanship of Sir John Rose Bradford to advise as to the principles upon which approval should be given.

Varia.

In future the urgency certificate can be applied to rate-aided as well as to private patients, so that urgent poor cases need not be removed to the workhouse but can go direct to a mental hospital. The urgency order must be signed by a duly authorised officer of the local authority and must be accompanied by the medical certificate and statement of particulars, as in the past. The authorised officer can, therefore, arrange for the removal of a rate-aided patient direct to the mental hospital without a justices' order.

The new Act affords further protection to certifying practitioners. The onus of proof of good faith and reasonable care is transferred from the defendant to the plaintiff, so that an action will not lie unless the defendant has acted in bad faith or without reasonable care. Moreover, the plaintiff must take out a summons for leave to proceed before he can commence his action, and such leave will not be given unless the Court is satisfied that there is substantial

ground for an action. In the past the plaintiff has been free to bring an action unless the defendant took out a summons to stay. Application for leave to proceed is to be treated as the commencement of the proceedings in any case in which proceedings are commenced within four weeks after the date on which leave to proceed has been given. This section is already in operation, having come into force on July 10th last.

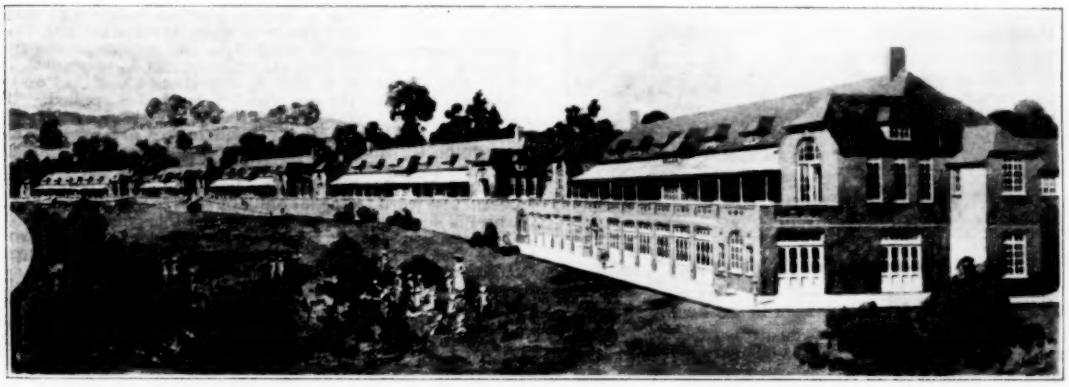
The final separation of the mental from the poor-law patient is made by Section 18, which declares that a person shall not be deemed to be in receipt of poor relief, or to be deprived of any right or privilege, or to be subjected to any disability by reason only that he or any member of his family is being maintained as a rate-aided patient under the Lunacy Act or the present Act. This does not affect the administration of pensions under the Widows', Orphans', and Old Age Pensions Act, 1929, the settlement or chargeability of a patient, the power to recover these expenses, or the repayment of maintenance expenses from any pension granted under any Royal Warrant or Order in Council, or under the Pensions Act, 1839. This section also came into operation on July 10th last.

The important changes in terminology in this Act include the substitution of the term "mental hospital" for "asylum" of "rate-aided person" or "rate-aided patient" for "pauper," and the elimination of the word "lunatic."

Summary.

The Board points out that the Act marks a great and striking advance in the law governing the treatment of mental illness.

The main principles of the Act are summarised by the Board as follows: 1. The preventive treatment of incipient mental illness by the provision of out-patient clinics and extended facilities for voluntary treatment. 2. A further advance in assimilating the treatment of mental illness to that of other forms of illness (*a*) by provisions under which certain cases may be temporarily placed under care and treatment without "certification" and (*b*) by the opportunities afforded of associating the general hospitals (municipal and voluntary) in the treatment of mental illness. 3. Extended provision for after-care and for systematised research into mental illness. 4. Dissociation of the treatment of mental illness from the poor-law. 5. Various important alterations in terminology reflecting the more enlightened view now taken in regard to mental illness.



Perspective view of the new buildings when completed.

LORD MAYOR TRELOAR'S CRIPPLES' HOSPITAL AND COLLEGE.

REBUILDING OF THE HOSPITAL.

THE foundation-stone of the new buildings was laid with Masonic ceremonial by Lord Ampthill just a year ago. The first of the five new blocks is now ready for occupation and the second block is under construction. The perspective view which we reproduce shows the buildings as they will appear on completion.

The existing wards are the timber structures remaining from the Princess Louise Military Hospital for troops returning from the South African War, and have been in use for just short of thirty years. The work of the hospital is going on without interruption during the period of rebuilding, as the scheme allows of the use of existing buildings until new ones are provided to take their place. Experience has proved the convenience of a unit of some size, both from the nursing and administrative points of view, and there will be five ward blocks of 60 beds each, making 300 beds in all.

These wards have all been planned with a southern aspect on a continuous terrace at the same level. The terrace will be 984 feet long and 25 feet wide, with sloping ways and steps leading to the ground, thus affording unrivalled facilities for sun treatment.

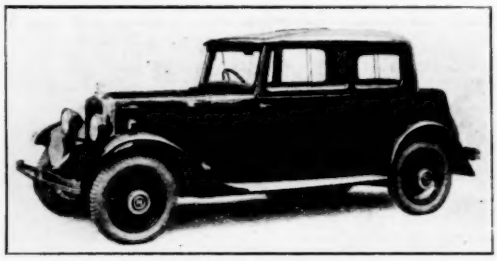
Each ward unit of 60 beds consists of two wards of 24 beds each, two wards of four beds each, and four cubicles, with the sister's office centrally placed for supervision. On the north side there is a sanitary spur at each end, with an administrative block in the centre, containing a ward kitchen, storeroom, and surgery. The southern front of the 24-bed wards will be fitted with folding doors which will enable each ward to be turned into an open-air gallery, while along the south front for a length of 136 feet will be a glass-roofed verandah, 10 feet wide, glazed with vita-glass, and designed so that one-half of it will slide, to afford protection in showery weather. On the north side the whole of the ward blocks are connected by a covered way.

THE OLYMPIA MOTOR SHOW.

DEVELOPMENTS IN 1931 MODELS.

IN this year's show, from the mechanical point of view, certain changes and tendencies are noteworthy. The greatest developments have been in gear-box and transmission systems. A few years ago the public made a fetish of top gear performance, and manufacturers were obliged to listen to the clamour. Engines became larger, cylinders were multiplied, and top gears became lower and lower. This was undoubtedly a retrograde step, for although cars would climb slopes of 1 in 12 or more at a reasonable speed in top gear, it was impossible to take advantage of a favourable wind or a downhill slope without the engine speed becoming excessive. The demand for top gear performance was caused by the difficulty of downward gear-changes; this year the manufacturers have gone to the root of the trouble and a special feature is being made of gear-boxes in which the change from top to third is made extremely easy. Salesmen no longer regard the gear-lever as an unmentionable necessity, but proclaim that it is

FIG. 1.



Morris Oxford (Six) Coupé.

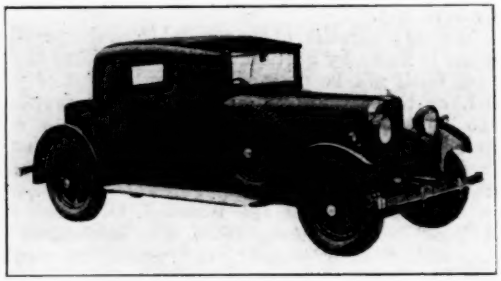
there to be used. This has been accomplished in a variety of ways which it is unnecessary to specify here; the result is excellent. Gear changes nowadays really are simple, and in many cases the third gear is not much more noisy than top. Thus, the third may be used continuously in traffic and the top ratio may safely be made higher and engine speed reduced. A few firms are more ambitious. The Mercedes-Benz multi-range gear-box consists of a small semi-automatic two-speed gear-box in addition to the normal three-speed, giving six speeds in all. Daimler and Armstrong-Siddeley have small quadrants on the steering-wheel by which the required gear may be pre-selected, and the actual change of gear does not take place until the clutch pedal is depressed.

A SELF-CHANGING GEAR-BOX.

In the Armstrong-Siddeley self-changing gear-box, all gear wheels are permanently in mesh. Each indirect gear is obtained by applying a band brake of special form to one of four drums. By moving the lever on the steering column head a gear may be selected in advance for subsequent use and engaged when required by depressing and releasing the clutch pedal, irrespective of the state of the gear when the selection is made. It is impossible for two gears to be selected or engaged simultaneously.

Arrangement of the Epicyclic Gears.—The arrangement of the gear is shown in Fig. 5. The elements have here been spread out and the number of planet pinions in each gear has been reduced to two for the sake of clearness. The reverse train R may be ignored. The essential driven member is the cage O_1 carrying the planets of the first gear train. The sun wheel of this train S_1 is integral with the engine shaft. If the annulus A_1 is brought to rest by a brake (the other brakes being free) the gear ratio is that of the train S_1—A_1, 3·67 to 1 direct. This is first speed.

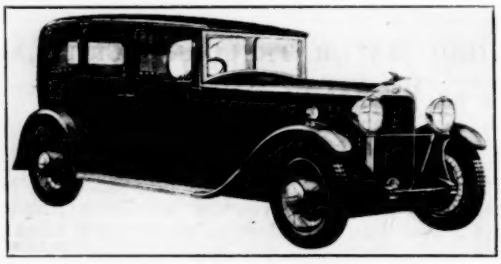
FIG. 2.



Talbot "75" Sunshine Coupé.

In order to understand the change to second speed we may imagine that the brake on A_1 is released and that on A_2 is applied. The sun wheel of this train S_2 is also integral with the engine shaft. The planet cage O_2 then rotates at a fraction of the speed of the engine in the same direction. It carries with it the annulus A_1 to which it is permanently connected. The result is to increase the speed of the planet cage O_1 thus giving a higher gear—actually 2·27 to 1, second speed. Third speed is more involved. The third speed epicyclic train is coupled to the second as shown—annulus A_3 to planet cage O_2, and annulus A_2 to planet cage O_3. The brakes on A_1 and A_2 are released and that on the drum B_3 to which the sun wheel S_3 is fixed is applied. The result is a gear reduction of 1·46 to 1, third speed. For fourth (direct) speed all the band brakes are released and the clutch C_3 (integral with S_3) is engaged with C_4 (integral with the engine shaft). Thus S_3, S_2, and S_1 are now all three running at engine speed. The inter-connexion between the second and third trains (annulus of each to planet cage of the other) is such that no rotation is possible except as a solid block at engine speed. Hence A_1, the first speed annulus, runs at engine speed. Since both annulus and sun of the first speed train are now at engine speed, the planet cage and propeller shaft are compelled to follow. All gears are locked. Reverse is best considered by imagining the propeller shaft to rotate and considering the consequences. It carries both O_1 and OR. AR is fixed by a brake, A_1 is free, but coupled to SR. Hence SR, carrying with it A_1, advances in the same direction as the propeller shaft at a faster speed. Thus the annulus A_1 overtakes the planet cage O_1, resulting in S_1 (the engine shaft) rotating in the reverse direction.

FIG. 3.

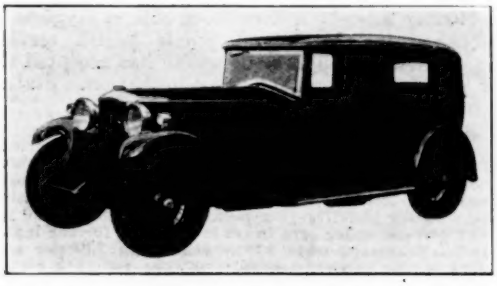


Humber "Snipe" Saloon (Fixed Head).

From the above explanation, together with an inspection of the sketch, it will be gathered that whenever the engine is running all the gears are in relative motion (excepting when the fourth speed clutch is engaged, when the gear is "solid.") In no case, however, are all gears simultaneously

transmitting power—i.e., some are always running idly. In particular, on first speed only the first gear train is transmitting power; on second speed, the first and second trains; on third speed the first, second, and third; and on reverse, the first and reverse trains.

FIG. 4.



The Mulliner-bodied Invicta.

Other mechanical details are of less importance. Attention is being paid to improvements in suspension systems, but these are mostly shock absorbers and rebound dampers which are designed mainly to overcome the inherent unsuitability of the leaf spring. Brakes are improved by the addition of servo motors or hydraulic systems of operation, chassis, on the whole, are lower, and there are many different kinds of unsplinterable glass available.

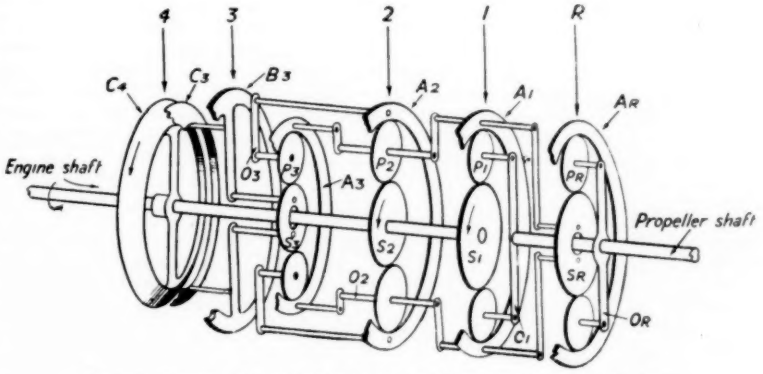
THE PRACTITIONER'S REQUIREMENTS.

In cars for the use of the medical profession the essential features are: reliability, easy starting, weather protection, economy and ease of upkeep, silence, smoothness, and ease of control. Reliability is, of course, the most important of these features, and, fortunately, most cars nowadays are reliable. In order to be quite safe the doctor should choose a model which has been in the hands of the public for a year or more, or a new model only from an established maker with a reputation to lose.

Easy starting is very closely connected with the question of quick warming up. Most cars supply heat to the induction system in one way or another. Exhaust heat is probably preferable to a water jacket as the warm-up is quicker and the engine will pull almost as soon as it is started. Thermostatically controlled radiator shutters are now fitted in large numbers and are reliable. Radiator muffs are adequate, but with constant stopping and starting it is easy to forget to adjust the flap. Thermostatic shutters are automatic and look after themselves. Several electric immersion heaters are, moreover, available. These can be plugged into the base of the radiator and keep the engine warm in a cold garage.

Weather protection is a question which has been debated endlessly, but it now seems that the open four-seater is almost dead. The examples at the show are almost all on sports chassis, and here the back seats are generally used as a luggage compartment. All-weather two-seaters are few. The hoods are generally very ugly when lowered, and there are many hinged joints and clip fittings which tend to rattle when the car ages. In theory the all-weather hood is ideal, but in practice it is almost always kept closed from one year's end to the other. In our climate days in which the weather is doubtful are far more numerous than brilliantly fine ones, and it is unreasonable to expect anyone to lower a complicated and finger-pinching hood when there may be a shower within the next twenty minutes. Tickford hoods, which may be wound up and down in a few minutes, are very convenient, but have the disadvantage that the hood piles high when down and sometimes makes it impossible for a driver who wants to back to do so without first getting out to ascertain whether any obstruction is immediately behind him. Probably the best compromise is a saloon or coupé with a sliding roof. These bodies are available on nearly every chassis, and any existing car can be fitted with a sliding roof at a cost of £7 to £10. These roofs can easily be slid back with one hand by the driver, and it is possible to take advantage of gaps between the showers. No complaints seem to be made about leakage so one may assume that the junctions are watertight. It is difficult to decide between the relative merits of the saloon and coupé body. The saloon is roomy and will take five people in comfort, but as the doctor's car will mostly only have one passenger, the coupé is probably the most convenient. An excellent example of this type of body is shown on the Talbot "Seventy-five" chassis. There is room for three medium-sized people on the wide front seat, and there are two occasional seats at the back. In addition to this there is a large trunk and luggage grid.

FIG. 5.



The arrangement of a self-changing gear shown in diagrammatic form.

In closed bodies efforts are being made to improve *ventilation*. Glass louvres are fitted at the top of the windows, and these admit air while keeping out rain. Gear and brake levers are frequently fitted with leather "trousers" to exclude draughts, and pedal slots have spring-backed washers to prevent the ingress of fumes from the engine.

Economy.—Whatever the design, cars of the same engine size will use about the same amount of petrol, but mileage per gallon depends more on the way a car is driven than on anything else; frequent stopping and starting always increases consumption, though the radiator shutters mentioned above are a great help.

Ease of upkeep is improved by rubber bushings which need no oil, and the "one shot" systems which lubricate all the chassis bearings by depressing a spring-loaded pump. These last now incorporate metering devices which ensure that one bearing shall not be starved at the expense of another.

Silence and smoothness are helped by the gear-boxes and rubber bushings mentioned above, and the popularity of six-cylinders at the expense of four makes for smoother running.

Ease of control is a point which, up to now, has not received the attention which it deserves. Nothing is more annoying than having to fumble for a minute switch with a heavily-gloved hand. Sitting back comfortably in the driving seat it should be possible to reach all the controls without moving the shoulders. This ideal is gradually being realised. Gear levers have been lengthened until they come up near the wheel and the hand drops naturally on to them. Lighting, ignition, and throttle controls are in a neat switchbox above the wheel in many models.

CARS WORTH LOOKING AT.

A doctor who has delayed his visit until the last two days of the show, which closes to-morrow (Saturday), will not be able to see more than a few of the stands. If he has no special well-tried friends to visit he may make some, giving attention to those on the following list, classified according to price.

Up to £250.—M.G. Coupé, £245; Citroën Six, £235: Standard Nine, £225.
Up to £400.—Talbot, £395; Austin Six, £335; Fiat, £381; Morris Oxford (Six) Coupé, £285 (Fig. 1).
Up to £550.—Talbot Coupé, £545 (Fig. 2); Crossley, £545; Vauxhall, £495; Humber, £485 (Fig. 3).

With the exception of the coupés, all the cars in this list are full saloons. They are all by established makers, and are eminently suitable for the owner-driver, though the Vauxhall and the Crossley would be equally good as chauffeur-driven cars. If a Harley-street practice requires an imposing car at a cheap rate, the Mulliner-bodied Invicta at £765 is attractive (Fig. 4). This is a distinguished-looking car with an excellent performance. The cars named above are only a few among a large number of excellent ones, which are fully described in the special show numbers of the various motoring journals.

Those who have time to visit the show should make a point of going round the gallery to look at accessories. They may be rewarded only by a headache, but they are more likely to come across exactly what they want in the way of accessories, such as spotlights and fog lamps, which are not yet standardised fittings except on the more expensive cars.

A new feature of the show is the Marine Motoring Section in the Empire Hall, and there is also a collection of cars of 20 years ago which does more to illustrate progress than do all the pony-skin trunks and cocktail sets of the £3000 class.

LIVERPOOL'S MILK-SUPPLY.—The Liverpool Health Committee have decided to call a conference of the authorities of all areas receiving Cheshire milk with a view to considering the question of a joint protest being made as to the method of examining dairy farms by the Cheshire County Council. It is urged that there should be routine veterinary inspection of cows by whole-time officers. Cheshire has about 3000 farms, and it is contended that the examination of only 100 samples of milk per annum does not meet the County Council's obligations in the matter.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

THE PUBLIC HEALTH SERVICE ADOPTS MENTAL HYGIENE.

A BILL has been passed by Congress and signed by Mr. Hoover whereby a division of Mental Hygiene is established in the federal public health service. Surgeon-General Hugh S. Cumming has accepted the new responsibility without any hesitation. Stating the need for such a division, he says:—

> The necessity for directing efforts toward the prevention of mental disorders, toward the conservation of mental health and toward the amelioration of adverse mental states is brought to our attention by the ever-increasing number of persons with mental disorders seeking aid in public institutions. During the fifty-year period from 1880 to 1930 the rate of persons under care in State hospitals for the insane alone has increased from 81 to more than 220 per each 100,000 of the general population. The rate has almost trebled, but the actual number of cases under care has increased to almost six times the number under care in 1880.

The new division's duties will be concerned with administration as well as with research. It will have charge of two farms, recently authorised by Congress for the treatment of persons addicted to the use of habit-forming drugs. Another important function will be the development of psychiatric services in the federal prisons.

VACCINATION RECOMMENDED TO UNDERTAKERS.

In an address given by invitation to the New York State Funeral Directors Association, the State epidemiologist, Dr. H. Jackson Davis, had some harrowing tales to tell of the risk that undertakers run from bodies infected by unrecognised small-pox. A Canadian corpse, he says, was responsible for an epidemic that resulted in 21 deaths. More than 50,000 people were vaccinated in the space of ten days and that epidemic was checked. Another outbreak was traced to an undertaker's assistant who had embalmed the body of a man of 74 years who was said to have died from kidney disease and heart failure. This assistant had never been vaccinated and had not had any experience of the exanthem of small-pox. However, when he himself fell seriously ill from the disease he had no difficulty in recognising that his rash was the same as that on the body which he had embalmed. Dr. Davis recommends that funeral directors be vaccinated every three years.

CHILDREN'S HOUR AT THE SURGERY.

The administration of a dose of toxoid is in itself a small matter, but the preparation therefor and the clearing up thereafter and the interference with other work make it much more extravagant of the doctor's time than it need be. So, at least, thinks the health commissioner of New York City, who proposes that general practitioners set aside a portion of one day in every week to be known as "children's hour." At this time children may be examined and receive various tests and prophylactic treatments. The commissioner suggests that the doctor should print cards describing the services offered, the time of the children's hour, and the fees for such standard treatment as vaccination or the administration of toxoid. This would, he hopes, increase the amount of prophylactic work done and encourage many mothers who now take their children to the public clinic, fearing that they could not afford private treatment, to go for such service to their own doctor instead.

GOVERNMENT CONTROL OF PATENT MEDICINE LABELS.

The authority vested in the federal government by virtue of the Pure Food and Drugs Act is exercised

actively by the Food, Drug, and Insecticide administration, an account of whose achievements may be found in their annual report. Manufacturers of standard pharmaceutical preparations are given credit for having voluntarily changed the names of many of their products, so that preparations that formerly were named "heart remedy," "liver stimulant," "indigestion tablets," &c., are now so labelled that their composition rather than their possible use is brought to the purchaser's attention. A special campaign was directed against a large variety of preparations brought into existence by the last influenza epidemic. Menthol inhalers, tablets containing various antipyretics, laxatives, gargles, even cubeb cigarettes, were labelled in such a way as to claim that they were an effective treatment for influenza. Legal action was taken in many instances with good effect. An attempt to exploit popular interest in vitamins by the sale of extracts of cod-liver oil, which, however, are without medicinal value, has also called for the attention of this bureau. It is probable, that, following a recent investigation by a Committee of the Senate, the resources of this administration will shortly be increased.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

MENTAL WORK AND BLOOD PRESSURE.

Dr. Fischer has inquired into the influence of mental work on blood pressure. He chose for his research 16 members of a chess congress who played three times a week from 6.30 to 10.30 P.M. Before the session and immediately after it ended the blood pressure in the brachial artery was measured. In 27 out of 48 measurements the blood pressure was unchanged or had decreased; in 15 cases there was an increase of 10 mm. Hg or less, and in only 6 cases an increase from 11 to 30 mm. It appeared that the increase was due to emotion during the play, especially in those who had lost time and according to the rules of the match were compelled to play quickly without time to consider their moves thoroughly. No difference was noted between smokers and non-smokers. In Fischer's opinion mental effort does not influence blood pressure; the important factor is emotion.

NECROPSY WITHOUT PERMISSION.

The head of a medical university clinic was recently prosecuted because he performed a post-mortem examination in face of the relatives' express request that he should not do so. The prosecution was for damage to property. The local court gave a verdict of not guilty because the defendant gave evidence that he did not know that the relatives had protested against a necropsy. On appeal of the public prosecutor the High Court confirmed the verdict. The court stated in their judgment that a prosecution for damage to property was impossible because a corpse was not a thing which could be damaged. This would be in contradiction with the feelings of the people. A corpse destined for burial was nobody's property, and the defendant would not have been guilty even if he had known that the relatives objected.

INCREASE OF THROMBOSIS.

Prof. Ludwig Nürnberger, head of the gynæcological Clinic of Halle University, has been studying the alleged increase of embolism and thrombosis. By comparing the statistical records of different pathological institutes and medical, surgical, and gynæcological clinics, he reaches the conclusion that the increase of thrombosis during recent years is not so great that it cannot be explained by chance. Some dissectors—for instance those especially interested in thrombosis—pay more attention to the condition than others. Sometimes, however, the increase is so great that it can be explained only by an abnormal condition. Some authors are of opinion that intravenous injection is responsible, but further clinical observations are necessary to decide the facts. The statistical records do not show clearly whether the increase is real or imaginary. Embolism has increased in the same proportion as thrombosis.

TRAINING OF SCHOOL MEDICAL OFFICERS.

The German Pædiatric Association discussed at their recent meeting the position and training of school medical officers. They point out that the schools as a national institution have not only to train the pupils but also to prevent damage during school life. The appointment of school medical officers should thus be more and more insisted upon. The medical officer should alone control questions of hygiene; he must be a member of the school board and a room must be set at his disposal for his work. To become a school medical officer a training of at least two years in pædiatrics is necessary. Apart from general pædiatrics a school medical officer should attend a course in school hygiene, where the combating of epidemics, the psychology and psychopathology of children, and the physiology of bodily exercise must be taught. Those appointed to the post should have an opportunity of following the progress of science by special post-graduate courses.

TREATMENT OF GRAVES'S DISEASE BY BLOOD INJECTION.

Prof. His has reported to the Verein für Innere Medicine on his experience with injections of sheep's blood as recommended by Prof. Bier for Graves's disease. He stated that he had treated 18 cases without any other remedy. The patients got intramuscular injections of 5 c.cm. of sheep's blood and then alternately the blood of sheep and of cattle. The cases were of medium severity. No undesirable accident was observed, except in one case, a general erythema with swelling of lymph glands. In one case the general state was considerably improved and the weight increased but in the others no influence on the general condition was observed. The frequency of the pulse was variable but a remarkable decrease was never noted. Prof. His concluded that in no case a real cure was obtained. Dr. Zimmer said that he had treated 120 cases. In the first series, including the severest cases, the average basal metabolism of +74 per cent. decreased by one third, the frequency of the pulse decreased from 120 to 89, and the weight increased by two kilogrammes. In the second series, including cases of medium severity, the average basal metabolism of +42 per cent. decreased by one half, while the pulse-rate fell from 102 to 85. In the third series, including slight cases, the basal metabolism of +15–29 per cent. decreased by a quarter to a tenth; the pulse-rate fell from 95 to 80 whilst the weight rose by 6 kilogrammes. The general state and vegetative troubles such as excessive perspiration, tremor, and falling out of hair became better. Neither the swelling of the thyroid gland nor the severe toxic heart symptoms were reduced.

PROFESSIONAL SECRECY AND THE REVENUE AUTHORITIES.

A medical man was asked to show his books because the Revenue Office doubted whether his statements

concerning his income were correct. He only showed to them a notebook, but the Revenue Office wished to see the original books where the names of the patients were recorded. He declined to do so and eventually destroyed the books. The Revenue Office accordingly assessed his income at a very high figure, and on appeal the Supreme Court of Tax Appeals gave a judgment that the office was entitled to do so because the medical man by destroying his books had made it impossible to them to ascertain his income. The action of the Revenue Office was thus legal and the procedure of the plaintiff illegal although he had alleged that professional secrecy might be broken by allowing the revenue officials to inspect his books.

WHITE ERYSIPELAS.

Dr. Samberger describes in the *Dermatologische Wochenschrift* a variety of erysipelas without the characteristic red colour of erysipelas. He calls it white erysipelas. In erysipelas the toxin of the microbes produces a lymphatic œdema by hypersecretion of lymph. If the strong toxicity of the streptococci or an increased irritability of the lymphatic vessels has produced excessive œdema the hyperæmia of the capillary vessels is covered by it. Instead of the ordinary red colour the skin then assumes a pale white hue with marked margin, which slowly creeps into the surrounding skin. Although the general symptoms are the same as in red erysipelas the diagnosis is sometimes difficult owing to absence of the red colour.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

AUTUMN CONFERENCES.

OCTOBER has been a busy month for conferences, although Paris was afforded some relief by holding the Congrès de Médecine Française at Liége. For the first time there has been a meeting of plastic (we call them æsthetic) surgeons, a branch of surgery which is taking a wide place in this country and has excellent work to show. Photographs, casts, and implements were an interesting feature of this meeting at which the principal speakers were Drs. Bourguet, Dartigues, Claoué, Peytoureau, and Stefani.

THE MEDICAL CONGRESS.

At Liége three principal topics held the field. Hyperthyroidism was opened by Labbé, Azerad and Dreyfus for the clinical part, by Dautrebande (Brussels) on the physiological side, by Bérard and Peycelon (Lyon) from the surgical point of view. The discussion which followed may be briefly summarised thus. Under the influence mainly of American surgeons there is a large movement towards surgical treatment, more and more in the direction of special surgery with long medical preparation and elaborate technique. X rays have many advocates; the question of iodine is far from decided. It seems that a certain eclecticism, amounting almost to pragmatism, is the rule among physicians who deal with thyroid patients. There is a fashion to use the prefixes hyper, dys, and hypo, the old names of Basedow, Graves, and myxœdema being held uncouth and lacking scientific smartness. The second topic was the use of insulin, with a review of all the possible conditions in which it may advantage the patient or the surgeon. No definite progress was registered and a more limited discussion might have been more useful for practical purposes. Calcium metabolism, the third and far the most interesting topic, was presented in a splendid report from Prof. Mouriquand (Lyon) on the present position. We know hardly anything, he said, of the principles that enable the organism to retain or to expel calcium; while we are wiser than ten years ago we are no wiser than 50 years ago, for medicine has simply rediscovered the cod-liver oil that was for a time so light-heartedly despised by clever people. The conclusion of the whole discussion was that all calcium preparations are hypothetical, sunlight and cod-liver oil remaining the champions of recalcification.

THE SURGICAL CONGRESS.

The annual meeting of French surgeons is always a lively occasion. It marks the beginning of the school year and coincides with the annual motor show which is, cynics say, the main reason of its success. Over this year's opening ceremony presided the great French novelist, Paul Bourget, a man whose literary career has been one long flirtation with medicine. His address was the story of that broken love and of the need of intellectual discipline in surgical work. Dr. Maurice Auvray spoke from the chair on the necessity for special practitioners of anæsthesia. Of the reports, one by Dr. Brocq (Paris) on hæmorrhagic pancreatitis, although a fine piece of work, was imperfectly discussed as hardly anyone present knew much about this chapter of pathology. MM. Trölich (Nancy) and Mouchet (Paris) reported on traumatic spondylitis, known in this country as the disease of Kümmel-Verneuil, which led to a good discussion, although little new was brought forward. The preparation of the patient for surgical operation was set out by Lambret (Lille), and Sauvé (Paris). From their report of the discussion which followed, it may be inferred that medical study of the patient before operation is the growing point in modern surgery; every day the help of the laboratory and of physiological thinking counts for more. Minute exploration of all the organs leads up to the evaluation of the functional capacity of the organism. Obviously the sum-total of such demands cannot be met in ordinary private practice, a fact which may lead to the birth of a new kind of specialist whose function it is to evaluate the vital capacity of the patient for operation, to control his diet and his preliminary treatment, and even perform accessory operations that may bring him to the operating table with the best chances of success. In this direction rather than in new technique or in individual skilfulness and celerity are better statistics to be looked for. Prophylactic vaccination has many supporters, although they do not agree on what to vaccinate against or what to vaccinate with.

SAFETY FIRST IN OPERATING.

Louis Sauvé drew attention to the fact that by the terms of reference to the subject under discussion he was prevented from dealing with the special problem of infection. Yet this was the most new and probably the most interesting chapter at the present time in the whole question of preparing a patient for operation, whether it be by vaccination, serotherapy, immuno-transfusion, or bacteriophage. With regard to blood transfusion, he noted that, at the meeting of 1924, one of the principal speakers, Pauchet, had advocated transfusion of untreated blood, while the other principal speaker, Jeanbrau, had remained faithful to citrated blood. Since then the general tendency had been in favour of untreated blood, although the harmlessness of citrated blood under ordinary conditions remained unchallenged. Since 1924 various more or less artificial sera have been recommended, but have not been able to change

the fact that, once hæmorrhage has reached a certain limit, the only procedure which will save the patient is the transfusion of fresh blood. The realisation of the truth of this teaching has led to the creation of blood transfusion centres, the best organised of which is to be found at Prof. Gosset's department in the Salpêtrière. The speaker concluded with the prophecy that, at an age when operative technique has become so perfect and the property of many, the future is no longer to the surgeon who performs miracles of operative dexterity, but to him who knows how to foresee the risks his patient will run.

INFORMATION BUREAU FOR THE FOREIGN DOCTOR.

It is probable that few foreign doctors visiting Paris realise that a bureau is provided specially for them. It is known as the Bureau des Relations Médicales avec l'Etranger, and it is to be found in the Salle Béclard, at the Faculté de Médecine. It is open from 9–11 in the morning and from 2–5 in the afternoon, Saturday afternoons excepted—a concession, no doubt, to the *semaine anglaise*, the recreational facilities of which are being more and more appreciated in France. The information provided by the polyglot staff of this bureau is, of course, adapted to the needs of the individual inquirer, but there is also a brochure of considerable general interest. It gives particulars of post-graduate courses—*cours complémentaires et de perfectionnement*—some of which are specially provided for the foreigner. At the Hôtel-Dieu, for example, four post-graduate courses have recently been organised for foreign visitors and have been attended by representatives of 20 different nations. Demonstration visits to places like Vichy are also organised. At the obstetrical Clinique Tarnier there is even a course free of charge, but as a rule a modest fee is charged for attendance at each course.

DEATH OF DR. DELAGENIÈRE.

It would be possible to count on the fingers the names of living surgeons in France who have attained prominence without official title. Yves-Henri Delagenière was one of these. He left Paris about 1890 to set up at Le Mans. At that time there were scarcely any surgeons outside Paris and Lyon, and Delagenière rapidly became one of the best known operators in the north of France and showed that a huge surgical practice is not incompatible with scientific work. He published much in surgical reviews, was a member of the Academy of Medicine, sometime chairman of the annual meeting of surgeons, and a Commander of the Legion of Honour.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

DUBLIN UNION.

DURING the past seven years the affairs of the Dublin Union have been managed by three Commissioners appointed by the Government. Following on the recent election of a city council for Greater Dublin, the Union will now come under the control of a committee appointed by that body. A summary published in the daily press of the work done by the Commissioners is a record of satisfactory progress, while there has been a reduction in the demand made on the ratepayers for expenditure on ordinary relief. In 1923, in the year before the Commissioners were appointed, the demand amounted to £281,000; in the last year it was £250,000. Nevertheless, every department of the workhouse has been painted and overhauled. Part of the premises of the old North Dublin Union was reconstructed and furnished, and placed at the disposal of a voluntary society for the reception of those who formerly entered the workhouse as "casuals." The experiment is stated to have been, so far, a great success. The men have improved morally and physically, and their comfort is greater than in the workhouse proper. The accommodation for infirm and epileptics has been greatly improved, and skilled attendants have been substituted for unskilled. In view of the large number of cases of cancer in the Union hospitals, plants for X ray and deep X ray treatment have been installed; this apparatus will also be available for poor-law patients from outside the house. All mental patients have been removed from the Union buildings to a new annexe of the Grangegorman Mental Hospital. The removal of the mental patients from the Union premises gave room for a much-needed extension of the grounds of the Consumptive Hospital. Improvement has been made in the accommodation for sick children in the workhouse; instead of occupying a top floor in the male hospital, they are now in a single-storeyed building standing in its own ground. The nursery at Pelletstown has been reorganised. The result of the changes can be seen from the following figures: for the year ended March 31st, 1924, there were 359 infants in the institution, with 96 deaths; last year there were 436 infants, with 66 deaths. Much attention has been given by one of the Commissioners, Mrs. Power, to the care of boarded-out children. The mortality among children boarded out by other persons than the poor-law authorities was formerly very high. Among 362 infants registered in 1923–24 there were 84 deaths. In 1927–28 there were 489 infants registered and 49 deaths; in 1928–29 there were 620 and 55 deaths; in 1929–30 there were 496 and 44 deaths. In 1923–24 there were 13 inquests in the city of Dublin on nurse-children; since 1927 there has been none.

ROYAL COLLEGE OF PHYSICIANS OF IRELAND.

At the annual stated meeting of the President and Fellows of the Royal College of Physicians of Ireland, held on St. Luke's Day, Dr. T. G. Moorhead, Regius professor of physic in the University of Dublin, was unanimously elected President. The following were elected censors:—In Medicine: Drs. W. G. Harvey and R. Marshall; in Medical Jurisprudence and Hygiene: Dr. W. J. Dargan; in Midwifery: Dr. G. FitzGibbon. The President nominated the senior censor, Dr. Dargan, as Vice-President. The following were elected Fellows of the College: Drs. E. A. Keelan, J. Lait, and F. MacSorley. In the evening the St. Luke's Day Dinner was held in the College Hall, the President in the chair, over one hundred Fellows and guests being present. Among the principal guests were the Chief Justice of the Irish Free State, Mr. Justice FitzGibbon, the President of the Royal College of Surgeons, and the Dean of St. Patrick's. The new President, Dr. Moorhead, besides being Regius professor of physic in the University of Dublin, is consulting physician to Sir Patrick Dun's Hospital. He was for many years visiting physician to the Royal City of Dublin Hospital, and for five years physician to Sir Patrick Dun's Hospital. He occupied the chair of medicine in the school of the Royal College of Surgeons for a time, and was King's Professor in the School of Physic for five years. The new Vice-President, Dr. Dargan, is senior physician to St. Vincent's Hospital.

ULSTER MEDICAL SOCIETY.

The opening meeting for the session of this Society was held in the Medical Institute on Oct. 16th, when

Mr. Howard Stevenson handed over the President's chair of office to Mr. Henry Hanna. Having given an account of the development of ophthalmology from earliest times, Mr. Hanna spoke of the changes that had taken place in the last year. The chief of these was the application of medical benefits for insured workers. He regarded this as an encroachment on the personal relations of doctors with patients, but trusted that Ulster doctors would continue to preserve their individuality. At no time in social history had there been such a wave of medical interest in human affairs, and through the pages of a prolific press laymen were fully alive to all matters affecting the general health of the community. Particular attention should, in his view, be paid by medical men to this movement. More medical men should take an interest in politics, more especially the more experienced and those not directly concerned with the pursuit of private practice. The subject of preventive medicine was looming large, and promised to play the part of vanguard in further advancement. In this connexion he noted especially antenatal clinics, medical inspection of school-children, and improved housing schemes. The conscientious, well-trained, general practitioner was the backbone of all such progress, and on his attitude and the ideal he set before him rested the hope of a successful issue. It was important to try to re-establish in the minds of the public the fact that the ideal of a true family physician was not dead. Speaking of specialisation, the President held that our science was tending to become too mechanised. Too many instruments were at our disposal for the elucidation of disease; for example, no part of the body was now immune from the prying interference of electric light in various forms. We might be tempted to rely too much on the machine and not enough on the man behind it. With ophthalmoscopes, microscopes, slit-lamps, electrocardiographs, doctors set out prepared to conquer and elucidate all disease, and were sometimes liable to forget that these were only complementary to clinican acumen.

BELFAST MEDICAL STUDENTS' ASSOCIATION.

The opening meeting was held in the Great Hall of the Queen's University on Oct. 17th, when Dr. Robert Marshall gave his presidential address on the Life and Work of William Harvey. The address was followed by the exhibition of the Harvey Memorial Film, which was kindly lent for the occasion by the President of the Royal College of Physicians, London. A large number of medical men availed themselves of the opportunity of seeing the film, and Dr. Marshall was congratulated on creating a precedent which proved of great interest and educational value.

DR. ANDREW LEITCH.

The sudden death at the age of 49 of Dr. Andrew Leitch, of Castlederg, on Oct. 6th, came as a shock to his many friends in Northern Ireland. He studied medicine in the Queen's College, Belfast, and graduated M.B. in 1905. He studied also at the London Hospital, taking his M.D. and D.P.H. in 1909. Returning to practice in his native county of Tyrone, Dr. Leitch was elected medical officer to Castlederg Union Infirmary, and was later made a medical examiner to the New York Equitable Life Insurance Society. He had a large and scattered practice, involving long journeys through difficult country and tedious tramps to cottages, impossible to reach save on foot. He never spared himself and was greatly loved in the district, though he took little part in public affairs. Dr. Leitch was a man of fine physique, and was one of the best Rugby forwards of his time. His genial hospitality made him an ideal host, and he will be greatly missed by a large circle of personal friends.

DR. HENRY DOBSON OSBORNE.

Dr. H. D. Osborne died on Oct. 17th at his home in Belfast in his seventy-fifth year. Born in County Derry, he took his medical course in Belfast and Edinburgh, qualifying in 1881. The same year he volunteered as a medical missionary of the Irish Presbyterian Church. After four years' service in India he was forced to return home on account of ill-health. He was appointed medical officer to No. 3 Dispensary District, Belfast, and held this appointment at the time of his death. Some months ago the Belfast Board of Guardians paid a tribute to his long and devoted service. For a considerable number of years he was visiting physician to the Belfast Maternity Hospital. Dr. Osborne took a deep interest in the social, philanthropic, religious, and masonic life of Belfast.

LONDON MEDICAL EXHIBITION.

THIS exhibition was opened in the new hall of the Royal Horticultural Society, Greycoat-street, Westminster, on Monday last. It was well attended; medical men, publishers, and others interested in the practical side of medicine took the opportunity of thus estimating the progress which has been made in pharmacology and the production of drugs, and in the manufacture of surgical instruments.

The exhibition was arranged in some 180 stands, while the fact that many of the exhibitors appealed to the interests of different branches of medicine and surgery makes the classification of the material shown only a general one.

DRUGS AND PHARMACEUTICAL PREPARATIONS.

In this section one of the most prominent displays was that of BURROUGHS WELLCOME AND CO. (Snow Hill Buildings, E.C.), who added to the utility of the exhibit by photographs, illustrations, and charts which demonstrated the action of some of their preparations. The exhibits included Diginutin, a stable solution of the total glucosides of digitalis leaf, physiologically standardised, and intended for oral administration, replacing tincture of digitalis, which is unstable and decomposes on dilution with water; and Epinalin, which combines the powerful but relatively transient action of adrenalin with the more prolonged effects of ephedrine. Other products shown were Infundin and Neo-Infundin. Neo-Infundin, the oxytocic principle of pituitary posterior lobe, has the same indications in labour as Infundin, but the absence of the pressor principle precludes the occurrence of the vasomotor phenomenon known as "pituitary shock."—HOFFMAN-LA ROCHE CHEMICAL WORKS, LTD. (51, Bowes-road, London, N.), made a feature of Sedormid as a sedative and mild hypnotic, practically non-toxic. Neither a bromide nor a barbiturate, this preparation, allyl-isopropyl-carbamide, is almost tasteless, and slightly soluble in water, while in organic solvents the solubility is somewhat higher. The melting point is 194° C. The manufacturers point out that this drug has a wide therapeutic field, acting as sedative or hypnotic according to the dose, while small doses taken at intervals during the day promote natural physiological sleep at night without any after feeling of lassitude.—CROOKES COLLOSOL SOLUTIONS (Crookes Laboratories, 22, Chenies-street, W.C.). A well-arranged display demonstrated innovations which have been made in this form of medication. The centre of interest of the stall was the intravenous solutions, normal saline, hypertonic saline, gum infusions, and glucose; in this connexion a collosol transfusion ampoule was shown—an apparatus holding 560 c.cm.,

and constructed with a view to ease of transport and simplicity in manipulation, while security from contamination is ensured.—On the stall of C. J. HEWLETT AND SON, LTD. (35-42, Charlotte-street, E.C.), were shown Hormonigen tablets, containing the hormones of the thyroid, pituitary, ovary, and testes; Somnigen, a purified solution of the hydrobromides of the alkaloids of opium in sherry, a standardised preparation free from nauseous after-effects; and Veronigen, a hypnotic remedy in liquid form designed to be a preventive of post-operative vomiting. "Colloigen" (alumina, argentum, calcium, sulphur and iodine—aqueous and oily—) were among the colloidal preparations shown, while many kinds of atomisers and sprays were exhibited, as well as Baron's Vaginascope, which is a compact, self-retaining, and illuminated speculum. The "Complete G.P." Bag, admirably arranged for holding a complete armamentarium for emergency and urgent treatment, met with approval.—A prominent display on the stand of BAYER PRODUCTS, LTD. (19, St. Dunstan's Hill, E.C.), of Avertin was to be expected, seeing the admitted value of tribrom-ethanol as a basal anæsthetic. The same firm showed Compral, a new analgesic in which pyramidon is combined with trichlorethyl-urethane, the anodyne effect being particularly useful in dysmenorrhœa; Ehrlich's Salvarsan preparations, Neo-salvarsan and Myosalvarsan; and Luminal, which many physicians employ in the treatment of epilepsy.

Among the preparations of PARKE, DAVIS AND COMPANY (50-54, Beak-street, W.) were Adrenalin Chloride Solution, the well-known natural constringent and blood-pressure-raising principle of the suprarenal gland; Citronin, a new preparation of potassium guaiacol sulphonate with ethylmorphine hydrochloride, designed for the treatment of asthma, catarrhal conditions of the respiratory tract, and bronchitis; Digifortis Tablets, each tablet contains 1 gr. of powdered fat-free digitalis leaves, physiologically standardised; and Elixir Sodium Sulphocyanate, a palatable preparation containing 20 gr. of sodium sulphocyanate in each fluid ounce, on which favourable reports have been made in the treatment of hypertension. Other noteworthy exhibits were:—Immunogens, a series of antigens originated by Dr. Ferry in the Research Laboratories of the firm—viz., Catarrhalis, Gonococcus, Pertussis, Pneumococcus, Staphylococcus, and Streptococcus. In most instances these products are available either as the antigen from the single organism, containing, in addition to the predominant organism, antigens from secondary infections. The following drugs were also displayed: Thromboplastin, a sterile suspension of comminuted brain tissue for local application in the control of hæmorrhage; Uritone Ampoules, containing 5 c.cm. of a 40 per cent. solution of Uritone for intravenous injection in the treatment of pyelitis, nephritis, anuria and dysuria; Ventriculin, a desiccated stomach extract for treatment of pernicious anæmia. Vaccines, the bacterial vaccines prepared in the laboratory of the Department of Therapeutic Inoculation, under the supervision of Sir Almroth Wright, at St. Mary's Hospital.—In the NORDISK INSULIN LABORATORIUM, Copenhagen, founded under warrant from the King of Denmark, the Danish Leo Insulin is manufactured under the supervision of Prof. Krogh, a Nobel prizeman in medicine. This insulin is uniform in strength and purity, and contains 16–20 international units per mg. of the dry substance. It is supplied in rubber-capped vials of 5 c.cm. as a sterile constant and stable solution without any preservative. The concessionaires for the British Empire are C. L. Bencard, Ltd.; for the Midlands, James Woolley and Sons; and for Scotland, John Bell and Croyden, in association with Savory and Moore.

HOWARDS AND SONS (Ilford) submitted to notice their Agotan brand of Phenylcinchoninic Acid, which corresponds to the B.P. quinophan, but is claimed to be of a higher standard of purity. The value of the preparation in various forms of rheumatism, gout, and neuritis is well established. The standard ether of this firm, which is in regular use in six of the large metropolitan general hospitals, was also displayed in its convenient form for distribution.—The stand of BRITISH DRUG HOUSES, LTD. (Graham-street, City-road, N.), demonstrated the policy of the firm in utilising the findings of research workers. The B.D.H. Vitamin Products, Radiostol, Radiostoleum, and Radio-Malt have been effectively introduced to members of the medical profession; the first has aroused interest recently as a factor in influencing perfect tooth formation and in preventing dental caries, and as an adjunct to calcium chloride in the lead selenide treatment of cancer. Carotene has been shown to confer complete immunity against the spontaneous infections occurring in rats fed on a diet deficient in vitamin A. It is available in sugar-coated pellets, specimens of which will be found at the stand. Quinanil is an antiseptic which owes its discovery to research carried out at Leeds University. It possesses high bactericidal value with low toxicity, and promises to be a valuable antiseptic for use in surgical operations and in the treatment of genito-urinary infections. The well-known preparation S.U.P. 36 was also displayed. The pharmaceutical preparations and drugs displayed by ALLEN AND HANBURYS, LTD. (Bethnal Green, E.), occupied three large stalls, and it is difficult to select any one preparation which shows more merit than another, but attention may be called to "B.S.C. Tablets" for the treatment of chronic constipation, hepatic disorders, and the toxæmias consequent upon stasis. The tablets contain active pancreatic extract with bile acids, an extract of duodenal mucous membrane, together with a proportion of ipecauanha. "Charkolin," a new agent for the treatment of intestinal infections with abnormal fermentation and the formation of toxins, has the absorbent properties of a highly activated vegetable charcoal with the toxin adsorbing qualities of Osmo Kaolin, a pure colloidal kaolin which is also a preparation of this firm. Lixen Brand Elixir of Senna Pods, prepared by a special process which eliminates the griping tendency, should also be mentioned. Each teaspoonful is equivalent to 12 large senna pods.

On the stall of OXO LIMITED (Thames House, Queen-street, E.C.), were displayed their therapeutical products, Liveroid (Oxo Ltd.'s Liver Juice), and Splenoxoid (Oxo Ltd.'s Spleen Juice); the former is designed for the treatment of anæmia in all its forms; the latter contains the essential constituents of spleen in concentrated form, and has been used in tuberculosis of the lungs, bones, and joints, and for the treatment of polycythæmia. Oxo, Hospital Oxo, Oxo Cubes, Lemco, Beef Essence, Lab-Lemco, and Oxoid Gland Preparations, in both tablet and fluid extract form, were included in the display.—BOOTS PURE DRUG CO., LTD. (Nottingham), were giving prominence to their "specific products," Stabilarsan, Sulphostab, Bismostab, and Gonococcal Vaccines. New preparations included Olivita, with a vitamin D content equalling cod-liver oil; Vitamalt, containing the essential vitamins; Reinforced Cod-liver Oil, and Compound Glycerine Thymol Pastilles, whose bactericidal value is strengthened by the "amyl meta cresol" content. Visitors were also introduced to Amyl Meta Cresol, a "Boots Research Antiseptic," with a carbolic coefficient of 250; Jacobson's Solution (benzyl cinnamic ester) for T.B., and a specially prepared Liver Extract (Boots), each container carrying the correct active fraction of ½ lb. of fresh liver.—E. H. SPICER AND CO., LTD. (Watford, Herts.), made a feature of Edwenil, "the natural antibody," which is available to the profession in rubber-capped bottles of 25 c.cm. The use of this preparation in bacterial invasion is recommended by Mr. Frank Coke, Dr. S. G. Billington, and Dr. Nevill Hornibrook in a handbook distributed by the firm. Dr. Billington's report appeared recently in the *Medical World*, and calls attention to the preparation alike as a diagnostic and a therapeutic agent.

(*To be continued.*)

PUBLIC HEALTH SERVICES

THE HEALTH OF LONDON.

Statistics for 1929. — Estimated (R.-G.) population 4,417,900. Births, 70,089; rate, 15·8. Deaths, 62,889; rate, 14·2. Death-rate from tuberculosis, 1·09; and from cancer, 1·55. Infant mortality-rate, 71; and maternal mortality per 1000 births, 3·61.

Dr. F. N. Kay Menzies reports that the birth-rate was the lowest ever recorded in London and that the death-rate was 2·1 higher than in the previous year. The markedly increased number of deaths was due to the severe influenza epidemic, associated with an unusually rigorous winter. In addition there was epidemic prevalence of whooping-cough, which caused 1141 deaths, the greatest number in any year since 1918. A table shows that the influenza epidemic had no effect on the deaths in the age-periods up to 25, and only a slight effect from 25 to 45; the bulk of the 9000 extra deaths as compared with the previous years were at ages over 45. Infant deaths showed some increase, mainly, however, owing to whooping-cough, and, considering the weather conditions, the increase in diarrhœal mortality of infants was negligible. Among the 28 boroughs the lowest infant mortality-rates were recorded in Lewisham (44), Stoke Newington (47), Hampstead (54), Hackney (57), and Hammersmith, Woolwich, and Wandsworth (each 62). The highest infant mortalities were recorded in Southwark (82), St. Pancras (82), Shoreditch (84), Kensington (86), Stepney (90), and Paddington (101). Fatal street accidents continue to increase and the total was 814, as against 747 in 1928. Among children under 15 years the deaths numbered 169, being an increase of 20.

INFECTIOUS DISEASES.

There were 1908 notifications of the mild type of small-pox, and 3031 cases were admitted to the Metropolitan Asylums Board hospitals from the London area. There were 9 deaths among these patients, including 6 from the administrative county. In 8 of the fatal cases there was no evidence of vaccination, but in one at the age-period 41 to 45 there had been infantile vaccination. Small-pox of the virulent type was introduced into London by the passengers and crew of the s.s. *Tuscania*. Altogether there were 45 cases with 8 deaths in different parts of the country, but none among the 7 London cases arising from this source. There were 15,855 cases of scarlet fever with 75 deaths, a case-mortality of 0·5 per cent.; and 11,788 cases of diphtheria with 350 deaths, a case-mortality of 3·0 per cent.

There were 312 notifications of puerperal fever and 758 of puerperal pyrexia. The childbirth deaths from puerperal fever numbered 132 and from other causes 121. Dr. Menzies gives a table of the childbirth deaths in the borough for the eight years 1920 to 1927, in order to avoid the misleading effect of the small figures of single years. The rate in the whole county for this period was 3·09 made up of 1·46 from puerperal fever and 1·63 from other causes. The six boroughs which showed the lowest childbirth rates during this period of eight years were Finsbury (2·31), Shoreditch (2·35), Greenwich (2·38), Stepney (2·45), Bethnal Green (2·54), and Southwark (2·69). For the year 1929 the County had a maternal rate of 3·61 and the boroughs which had the lowest rates were Deptford (1·08), Greenwich (1·22), Finsbury (1·48), Battersea (1·91), Shoreditch (2·00), and Southwark (2·17). It is of interest to note that four of the six boroughs which had the lowest rates in 1929 —viz., Greenwich, Finsbury, Shoreditch, and Southwark—also had the lowest rates for the longer period of 1920 to 1927. The boroughs with the highest maternal rates for 1929 were Wandsworth (4·97), Hampstead (5·17), Lewisham (5·21), Woolwich (6·06), Kensington (6·29), and Chelsea (9·51).

There were 351 cases of enteric fever with 45 deaths. A remarkable incident was the occurrence of 12 cases of typhoid fever in Lambeth, 2 of which were fatal, in a house occupied by two families. The source of the infection could not be traced. Typhoid fever was also prevalent in September and October in south-east London and the neighbouring districts of Beckenham and Penge. There were 124 cases of which 7 were fatal, 6 in Lewisham and 1 in Penge. Investigation indicated that this epidemic had originated from a source of infection which was active about Sept. 14th, and again about Sept. 26th, and further evidence incriminated a ham and suggested that the outbreak was caused by a carrier, who had infected cooked food. Four genuine cases of anthrax were reported, none of which was fatal. Infection in one case was ascribed to a recently purchased fur coat and in the other three to the handling of skins or hides.

Among 59 confirmed cases of poliomyelitis, 6 proved fatal and 2 deaths of unnotified cases were recorded; of 71 genuine cases of encephalitis, 25 were fatal and 32 deaths of unnotified cases were recorded. Formerly accommodation at the Northern Hospital for post-encephalitics has been limited to children from 3 to 16 years, but the Metropolitan Asylums Board recently set aside 50 beds for adults. Between May and December, 57 adults were admitted, but unfortunately the provision is quite inadequate and there is a long list of patients waiting for admission.

The death-rate from pulmonary tuberculosis was 0·96 and from other forms 0·13. There are now on the registers of the metropolitan boroughs 32,117 cases of pulmonary tuberculosis (in the proportion of 18 males to 14 females), and 12,730 cases of non-pulmonary tuberculosis (in the proportion of 11 males to 10 females). The cases of pulmonary tuberculosis on the registers number about 7·6 times the annual deaths, while the non-pulmonary cases are 22 times the annual deaths. Dr. Menzies discusses the apparently high tuberculosis mortality among the patients in mental hospitals. First, it appears that the death-rate from pulmonary tuberculosis among male patients is two and a half times and among female patients seven times the normal. When correction is made for the higher death-rate from all causes among mental patients and the rate is expressed as a percentage of all deaths, the phthisis deaths among male mental patients are found to be lower than normal but the female deaths are in marked excess. Another correction has to be made for the much greater proportion of deaths from general paralysis of the insane among the male mental cases. Such deaths are six times as frequent among males as among females. When general paralysis is excluded the death-rate from tuberculosis among mental patients approximates that for London as a whole, the male rate being in excess of the female. Experience has shown that the phthisis mortality of a mental hospital is mainly governed by the phthisis mortality of the area from which the patients are drawn. Dr. Menzies's conclusion is that the phthisis mortality in the Council's mental hospitals does not differ materially from that of the general population.

ADMINISTRATION.

Inquiry was made during the year into continental systems of refuse collection and disposal, and how far they are adaptable to London; the City of Westminster is investigating systems of dustless collection. The boroughs are being urged to consider the improvement of facilities with regard to public conveniences. Revised by-laws have been drafted for house drainage, endeavouring to put modern requirements into plain technical language. Private slaughter-houses in London are rapidly disappearing. In 1873 there were 1500, in 1928, 109. Under these circumstances, and in view of the development of motor transport, the Council have decided that additional public abattoirs in London are not required.

Housing.—The Carlyle-street improvement scheme

in St Marylebone was confirmed by the Ministry in February. Between 1911 and 1921 the size of the average family decreased from 4·153 persons to 3·786. During the period 1921–28 the population of London decreased by 55,000 and the houses increased by 30,000. There was an overflow of 258,000 persons to the outer London area. The Council erected 22,622 houses in this outer area and therefore provided for over 100,000 of the overflow population. The smaller family does not diminish the demand for houses but does diminish some of the overcrowding. There is still much overcrowding of large and growing families, and a disinclination to move if the tenant thereby loses the protection of the Rent Restriction Acts. The Council allocates half its new houses to the boroughs and urges them to see that the houses vacated are not again overcrowded. By far the worst feature of London's housing is, in the opinion of Dr. Menzies, the underground rooms and basements. He strongly urges that statutory authority should be obtained for the closure of the basement portion of houses which are otherwise habitable. When basements are closed there is a 100 per cent. removal of the worst insanitary conditions in housing at a far less cost than the clearance of insanitary areas in which certainly not more than a quarter of the living rooms are so grossly insanitary as the worst type of basement dwellings. There are some 30,000 basement dwellings in London, which are unfit for human occupation. They are not all separately occupied, but house about 100,000 persons.

Milk.—Out of 2084 samples of outside milk biologically examined 158, or 7·5 per cent., yielded tubercle bacilli. The cows kept at the mental hospitals were inspected quarterly by the veterinary surgeon. In addition samples are taken of the milk, as supplied twice a year. Out of 81 such samples 8 were found to be tuberculous. The cowsheds in the County have diminished from 738 in 1888, the year of the Council's inception, to 52. The cows are examined quarterly by the veterinary surgeon and are now under 2000.

Venereal Diseases Scheme.—The new V.D. cases numbered 15,985, about 400 less than the previous year. The attendances of venereal cases per new case show a steady improvement. The figure was 40 in 1927, 46 in 1928, and 48 in 1929. Medical practitioners use the scheme increasingly. The hostel accommodation for young women under treatment has proved valuable, but the arrangement for securing vocational training at rescue homes has not been utilised as anticipated.

The *Antituberculosis Scheme* works smoothly and the care committees have provided valuable assistance for patients. Handicraft classes have now been established in 11 boroughs. An attempt has been made on a small scale to train young women for posts in the Metropolitan Asylums Board institutions and young men for work in the parks. The after-history of patients treated in residential institutions during 1923 shows that of 3396 adults 1293 were alive at the end of five years, of whom 57·5 per cent. were at work and 5·7 per cent. were fit for work but unemployed. Of 474 children discharged from institutions in 1923, 383 were alive after five years. These survivors included 133 pulmonary cases, of whom 41 were at school and 79 at work, and 250 non-pulmonary cases of whom 102 were at school and 116 at work. Every child requiring institutional treatment receives it promptly and at the end of the year there was no child waiting for a bed.

In the section dealing with the *Mental Deficiency Act* an investigation by Dr. F. C. Shrubsall of the family histories of 1360 cases of the various grades of mental defect which came under notice in 1928 and 1929, shows that in only 129, or about 9·5 per cent., was there a brother or sister who was also mentally defective.

Dr. Letitia Fairfield gives particulars of the after careers of children who have been deemed ineducable at school and also a survey of women delinquent defectives referred by the London police-courts in the five years 1925 to 1929.

REPORTS OF SCHOOL MEDICAL OFFICERS.

—	No. on roll.	Average attend-ance.	Routine inspec-tion.	Special examina-tions and reinspections	Percentage of defects.
County of Nottingham	54,041	47,604	15,753	20,850	25·48
Bristol.. ..	54,502	47,687	13,420	44,475	15·4
County of Northampton	25,588	—	7,277	1,505	20·02
Lincolnshire: Parts of Holland ..	11,300	9,945	3,715	4,159	30·0

County of Nottingham.

Dr. Christopher Tibbits describes the filling up of two large lacunæ in the service. Reorganisation of the county dental service, involving the appointment of four more dentists and four more dental nurses, working under an administrative chief dental officer, will ensure not only more frequent dental inspections and treatment, but also a more equitable distribution of facilities. The extension will cost about £4000 a year, but it will be sound economy; for at present much of the value of the dental work has been lost owing to the length of time between the visits to schools. This provision may still suffice when the dental service is extended to pregnant women and pre-school children, a development which would reduce the average cost of treatment. The second improvement is a system of providing spectacles immediately they have been prescribed, the parents undertaking to pay for them later. As a result, the proportion of children who obtained glasses when ordered rose from 45 to 83 per cent., and the great majority of the parents have fulfilled their promises. Moreover, the number of cases in which glasses had to be provided gratuitously fell from 124 to 46. Parents have been attracted by the non-rusting nickel frames at a maximum price (for compound lenses) of 6*s*. As in so many other matters, the greatest credit is due to the efforts of the teachers. A slight increase in the medical staff made it possible to overtake all the leeway caused by staff vacancies early in the year. In future appointments the salary scale will be brought up to the accepted level and candidates must possess the D.P.H. diploma and have had at least three years' post-graduate experience. Salaries of nurses will also be made adequate to maintain the strength and quality of the service. Dealing with the work of the school doctor, Dr. Tibbits mentions the risk of stagnation and how this is minimised by the potentialities for investigation. His report contains an account of three inquiries. The first is a survey by Dr. Tibbits himself of dental administration, in which it is laid down as a basis for staff needs that a whole-time dentist can inspect 4000 children annually and treat half of them. The second by Dr. C. W. Jeremiah discusses the results of treatment of otorrhœa by glycerin and flavine, which he finds promising. Early treatment is imperative if a sound ear and normal hearing are to remain when discharge ceases. It would be well for infant welfare centres and schools to distribute a leaflet calling the attention of parents to the wisdom of seeking advice on the first sign of discharge. Dr. John Ferguson compares alternative methods of treating otorrhœa (1) by glycerin and flavine, where he is in general agreement with Dr. Jeremiah, and (2) ionisation, which he finds more likely to be successful in recent cases where there is no unhealthy granulation tissue or focal sepsis. If no marked improvement follows 16 treatments, he regards further ionisation as a waste of time.

Bristol.

Dr. R. A. Askins in his last report (for he is leaving to take up an important post in South Africa) tells of increasing activities; an additional whole-time medical officer and two extra nurses have been appointed. In September, when the new members of the staff took up their duties, the clinics were made available for the treatment of minor ailments among pre-school-children, thereby rendering more effective the coördination between school medical and public health committees. The oculist, Dr. R. R. Garden, remarks that as time goes on there is a decrease in the proportion of cases referred for the first time after the children have entered school—an indication that the control of squint is now being obtained in the early stages, when treatment can be given with the best results. He stresses the value of orthoptic methods in restoring vision to old squinting eyes. The orthopædic surgeon, Mr. H. Chitty, is also seeing cases in his department at an earlier stage. The school dentists attend to the teeth not only of school- and pre-school-children but also of expectant mothers—the figures this year being 252 and 188 respectively—and of patients referred from the tuberculosis department. Diphtheria was unusually prevalent in 1929, and the health committee decided to extend as widely as possible the Schick method of immunisation. This year it is proposed to establish a child guidance clinic to deal with so-called difficult children, a task for which Dr. Askins regards the school medical service as especially well fitted; the medical officers have experience in dealing with mental and physical defects, and the nurse being welcome in the homes can obtain information about environmental factors. We think he is not overstating the potentialities of a staff which is familiar with these problems in its daily work, is in close touch with the teachers, and acquainted with the schools as well as the homes. The school doctor who takes a special interest in practical psychology is thus better able to grasp the situation as a whole than a non-medical psychologist.

County of Northampton.

Dr. J. M. Mackintosh, who writes the report, did not become school medical officer until the end of the year, the actual achievements of which do not reach the level he would have desired. The fundamental object of the service is, he writes, to prepare each child to take his place in the world as an independent citizen, sound in body, clear in mind, and with some standards of moral and social conduct. Towards its realisation he mentions two principal methods of approach:—

(*a*) "The investigation (and, we would add, the removal) of the causes of physical and mental inefficiency which prevent the child from deriving full benefit from the education which the State provides."

(*b*) "The education of the child in personal and social hygiene, so that he is enabled not only to avoid the disasters which result from ignorance of the principles of clean and healthy living, but also to develop his physique to its full potential capacity."

In the early days of school medicine attention was mainly devoted to the former, but in course of time it became evident that not a few of the disabilities of the young child were due to early factors, and a further extension of preventive work is being undertaken to safeguard the expectant mother and her unborn child. "Finally," he adds, "the wheel is turned through its full cycle, and we begin to realise more and more that ignorance of the principles of hygiene, of the duties and responsibilities of parenthood, is the chief cause of ill-health in the succeeding generation." Thus the second object is reached and the school doctor must become a teacher, working in coöperation with all branches of the teaching profession. Dr. Mackintosh insists on the necessity of giving medical officers time and opportunity for investigation and research. His remarks conclude with a wise discussion of the teaching of sex hygiene. The achievements of the past year were limited by shortage of staff, so that 74 departments were left unvisited while reinspection and investigation could not be carried out. There is need for another medical officer, and one full-time nurse can hardly be adequate for a county, even though 74 district nurses give part-time help. In spite of these handicaps much good work was done.

Lincolnshire: Parts of Holland.

Dr. H. C. Jennings reports the coming into force of a scheme for the operative treatment of tonsils and adenoids which is working well. An additional dental surgeon was appointed in April, and the cost of dental treatment per child has fallen by 2*s.* 4*d.* a head on account of the larger numbers dealt with. Each of the dentists is provided with a fully equipped travelling clinic, and it is found that these dental vans form the right expedient for rural areas. The running cost is stated to be about £80 a year for one van, and £143 (proportionately less) for two. The percentage of acceptances for treatment was 47, better than in many counties; this, Mr. H. G. Fletcher, L.D.S., remarks, is gratifying, since the 9-year-old group now being dealt with can generally avoid treatment either by influencing parents unable to resist their protests, or more simply by failing to take home the notices. Dr. Jennings thinks he would get higher figures if there were a portable cinematograph apparatus worked from the dental van. Such a method of enlightenment would help to give the parents a right outlook on dental matters. An important part of the dental officer's duty is to give instruction in the means by which dental operations can be avoided. Dr. Jennings finds the standard of school cleanliness varies much in the county, and he is sure that more systematic supervision by head teachers would produce better results. Matters are made much easier, he remarks, when the playgrounds have impervious well-drained surfaces.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED OCT. 11TH, 1930.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 44 (last week 74); scarlet fever, 2008; diphtheria, 1422; enteric fever, 44; pneumonia, 651; puerperal fever, 49; puerperal pyrexia, 114; cerebro-spinal fever, 13; acute poliomyelitis, 21; acute polio-encephalitis, 2; encephalitis lethargica, 18; continued fever, 1; dysentery, 4; ophthalmia neonatorum, 109. No case of cholera, plague, or typhus fever was notified during the week.

The notifications of small-pox are fewer than for many months past. Of the total of 44, 23 were reported from the county of London, and the remainder from the following 6 counties: Essex, 12 (of these West Ham 6); Lancaster, 1 (Urmston); Leicester, 5 (C.B. 2, Loughborough 2, Blaby R.D. 1); Stafford, 1 (Stoke-on-Trent); Glamorgan, 1; Monmouth, 1.

The number of cases in the Infectious Hospitals of the London County Council on Oct. 14th–15th was as follows: Small-pox, 140 under treatment, 4 under observation (last week 168 and 1 respectively); scarlet fever, 1647; diphtheria, 1953; enteric fever, 23; measles, 98; whooping-cough, 127; puerperal fever, 17 (plus 6 babies); encephalitis lethargica, 119; "other diseases," 38. At St. Margaret's Hospital there were 13 babies (plus 2 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 5 (1) from enteric fever, 8 (1) from measles, 8 (3) from scarlet fever, 7 (2) from whooping-cough, 31 (8) from diphtheria, 55 (14) from diarrhœa and enteritis under two years, and 23 (3) from influenza. The figures in parentheses are those for London itself.

The deaths from enteric fever outside London occurred at Stoke-on-Trent, Grimsby, Liverpool, and Huddersfield. Liverpool reported 3 deaths from measles. Fatal cases of diphtheria occurred at Liverpool 6, Cambridge and Birmingham each 2. Diarrhœa accounted for 4 deaths each at Nottingham, Liverpool, and Manchester, 2 each at Salford, Leeds, and Cardiff.

The number of stillbirths notified during the week was 263 (corresponding to a rate of 39 per 1000 births), including 46 in London.

CORRESPONDENCE

A MEDICAL SERVICE FOR THE NATION.

To the Editor of THE LANCET.

SIR,—It was with some feeling of chagrin that I read Dr. Evans's letter, and I trust that it may not be taken as reflecting the sentiments of any large section of a profession whose greatest function is the alleviation of suffering in whatever station of life it may be found. Primarily it might be of interest to conjecture as to what part medicine on "wholesale lines" has played in the production, or in the prevention of production, of a population of whom he states a large proportion is composed of "morally, physically, and mentally inferior people." Then, too, in the present phase of industrial depression, a phase which from all appearances is not likely to be evanescent, the number of people "not economically worth private doctoring" assumes gigantic proportions, and we trust that this is not ascribed to some inherent moral degeneracy in the affected individuals.

Time was when the voluntary hospitals were presumed to function for the relief of the indigent poor, but there has grown up of late among a not inconsiderable portion of both the medical and lay public a feeling that a very different qualification from poverty is necessary to secure admission to these wards. Dr. Evans seems intent on abolishing poverty entirely from these beds, a proposal which will not meet with much approval from the majority who subscribe hardly earned cash to institutions whose very name is becoming yearly more anomalous. Fortunately, municipal opinion in many cities is taking a more farsighted and humane view of the needs of their poor, and is even now attempting to move away from "wholesale medicine" to a standard of treatment which, ere long, will compare favourably with that meted out at any voluntary hospital Curious to relate, too, this work in many instances is being performed by members of the profession, who still think in terms of human maladies, rather than in the economic fitness of their patients for treatment, and whose ideal of service is not always directly proportional to their scale of payment.

We must, I think, in attempting to formulate schemes for the future of the profession, bear in mind the fact that unless we are prepared to study and provide personal treatment for the relatively poor, always noticing that each decade with its increasingly expensive diagnostic and therapeutic measures adds to this number, we shall not only incur a widespread odium, but we shall accelerate the physical and mental, and consequently the moral degradation of the strata to which Dr. Evans refers.

I am, Sir, yours faithfully,

Birmingham, Oct. 19th, 1930. H. JOULES.

To the Editor of THE LANCET.

SIR,—I have read Dr. Evans's letter with interest, but there are certain things in it which in my opinion are open to grave criticism. Thus on the subject of State service he writes:—

> "Those who have served the State in any capacity know well that the individual is sacrificed to the State . . ."

As one who has been in a State service since 1912, either on a whole- or a part-time basis, I must deny this. It is true that during the war the welfare of the individual sometimes had to give way to the exigencies of the service; but any sacrifice there made was inherent in the state of war, and not in the State Medical Service. Again:—

> "It is assumed, in the first place, that the best doctoring is provided by a patient's private doctor who is paid for his work."

This again I deny. It is contrary to the whole experience of our voluntary hospital system. This has served the country well for hundreds of years, and has been the crucible of great traditions of personal service, one of which is that the poor person, relying on the charity of the doctor in a time of sickness, has received from him just as loving care and skill as the person who pays high fees. I do not believe that when that patient passes from the voluntary to the municipal hospital he receives any the less the best care and skill that that man can provide; nor is it my experience that the doctor, whether consultant or general practitioner, who sees the widow and orphan for nothing gives them any less good service.

This assumption is a repetition of his second objection to an extension of the present insurance service.

> "Another objection is that, taken as a whole, in spite of the fact that the roll of panel doctors includes the best men in the profession, panel practice cannot be carried on at a sufficiently good standard for reasons that are too well known to the profession to require enumeration here. If the number of panel patients, therefore, is increased, it will inevitably increase the practice of inefficient medicine."

Now this is a most serious statement to make. The present administration of the Insurance Acts is based upon the assumption that each doctor gives to his panel patients exactly the same medical attention as he gives to those who pay him for services rendered. What then are these reasons "too well known to the profession" upon which Dr. Evans bases his statement that the contrary is the fact? He should state them clearly, so that laymen also may know them that they may take steps to amend the administration of these Acts.

But Dr. Evans's most deplorable statements are these. That a large proportion of the nation economically is not worth the doctor treating in private practice, that they are morally, physically, and mentally inferior people, and that they must be treated even on a cheaper scale than that which panel practice entails. He adds that in this there is "no class distinction," and from his context one learns that by this he means the standard of living. To what does that word economically refer? On first sight it reads as though it referred to the doctor's practice; but the end of the paragraph suggests he means to the nation. Mentally and morally the weaklings may be spread equally throughout the nation, but there is no doubt that physically there are more inferior people among the poor. Yet at birth all are equal, and it is the function of the State to eliminate the factors that make this difference. To do this will economically be well worth while.

I am, Sir, yours faithfully,

Queen Anne-street, W., Oct. 20th, 1930. T. B. LAYTON.

To the Editor of THE LANCET.

SIR,—Dr. Evans's letter is very much to the point. At present the medical profession is in danger of becoming merely a band of qualified clerks, and the patient reduced to the level of a clerical error. The only hope is that increased bureaucratic control will

be prevented, at least temporarily, by the poverty of the nation, and that during this time wiser counsels will prevail. Under Government control medical research might well be stationary for the next hundred years. There would be no room for Mackenzies and Bantings. I am, Sir, yours faithfully,

Oct. 20th, 1930. J. C. G. DICKINSON.

GALL-BLADDER DISEASE.

To the Editor of THE LANCET.

SIR,—Absence from home, at the meeting of the British Medical Association in Canada, has made it difficult for me to bring myself once more abreast of current literature. It is for this reason that only to-day have I read the leading article in your issue of August 16th, and the paper by Bryan Williams and McLachlan upon which it is based.

Discussions as to the sources of infection of the gall-bladder have not yet allowed the conclusions of any investigator to be generally accepted. The views of Rosenow, Walton, Wilkie, and others that infection as a rule is blood-borne is not in accord with evidence I have submitted. Two years ago I gave an account [1] of 81 consecutive cases in which the most careful investigations were made for me by Dr. A. L. Taylor and others, in order to throw light upon this question. In 63 cases the infection undoubtedly began in the outer coats. In the remaining 18 it appeared probable that infection beginning in the outer coats attacked the inner coats more severely only when impaction of a stone in the cystic duct caused obstruction, quickly followed by inflammatory changes which fell upon the mucosa first. Subsequent experience has confirmed all these findings. So far as my own work is concerned, there can be little doubt that it is upon the outer side, and not through the bile or from blood-vessels, that infection first reaches the gall-bladder.

The surgical significance of this is apparent; and the difficulty of treating cholecystitis by drugs which first reach the interior of the gall-bladder is explained.

I am, Sir, yours faithfully,

Portland-place, W., Oct. 20th, 1930. MOYNIHAN.

AUSCULTATION OF MUSCULAR TREMOR.

To the Editor of THE LANCET.

SIR,—In Dr. Young's admirable survey of the rôle of the stethoscope, which appears in your last issue, he mentions the value of auscultation in the examination of abdominal organs and of the joints. I would like to emphasise its use in another field of medicine—namely, neurology. It frequently happens that a tremor is audible with a stethoscope when it is neither visible nor palpable, and this applies especially to the parkinsonian tremor. Auscultation of an apparently quiescent muscle in a case of suspected parkinsonism will often reveal a rhythmical "thudding" of a frequency approximately five or six to the second which is exceedingly characteristic. It may be found in any muscle; it is most readily discovered when present in the flat muscles of the back. When it is heard it confirms the suspicion that parkinsonism is present and the diagnosis may be made long before visible tremor is manifest or much in the way of rigidity. I am, Sir, yours faithfully,

Manchester, Oct. 18th, 1930. DONALD CORE.

[1] Brit. Med. Jour., 1928, i., 1.

THE SCIENCE OF MEDICINE AND CANCER RESEARCH.

To the Editor of THE LANCET.

SIR,—Lord Moynihan's philosophical survey of the science of medicine in THE LANCET of Oct. 11th is like an excursion on the moors or the mountains after close work in some stuffy office. There can be no question but that the principles which should underlie and inform the conduct of medical investigation have been much neglected. In calling attention to them and to the ways in which a campaign against disease may be hindered or lost by wrong tactics or wrong strategy, Lord Moynihan is doing us, as well as the public, an invaluable service.

That such is the case becomes obvious when we inquire into the history and present position of cancer research. That the research into the cause and nature of cancer is making no headway is obvious to everyone who has followed its drift since the movement began with the beginning of this century. No one can attribute this to any want of effort of ingenuity or of perseverance on the part of those who have devoted themselves to this form of investigation. One need but glance at the mountainous size and to the excellent quality of the material thrown up by these diligent workers, as recorded in magazines and books, to be convinced that the fault does not lie in this direction. Indeed the very thoroughness with which the research has been carried out is in itself pretty convincing evidence that the error must be sought for elsewhere, and that it probably exists in some fundamental defect in the method of working.

One of the flaws referred to by Lord Moynihan as apparent in laboratory methods of research in general can readily be detected in cancer research. Carried away by the enthusiasm associated with the discovery of a novel and alluring form of inquiry, the early research workers made the very excusable mistake of magnifying the importance and prospects of their new method and of minifying the work of those who had preceded them. So much was this the case that those who followed them seemed to lose sight of the fact that the results of the nineteenth century methods of wide and extensive investigation on Baconian lines though slow were sure. They failed to give the credit that was due to the older workers for the really satisfactory progress that they had made in the knowledge of the structure, diagnosis, and surgical treatment of cancer, nor for the distance they had gone towards a solution of the main problem of its origin and nature. Clinicians and pathologists, working in concert with biologists, general practitioners, and other observers, had come to the conclusion, on the best of evidence, that cancer cells are not primarily the work of micro-organisms of external origin, but are the lineal descendants of cells native to the body in which the cancer grows. They had also decided that cancers are brought into being —caused—by certain non-specific stimulants or irritants. It was while following this clue and while engaged in the definition and classification of cancer-producing agents that the discovery was made that tumours can be artificially produced in rodents, with the result that the inquiry was almost suddenly diverted from the pursuit of cancer in man to the pursuit of cancer in mice.

If a mistake was made in belittling the work of our forbears, it was an equally serious mistake unduly to exalt the new form of research. Instead of keeping it in its place as an adjunct to large methods of

inquiry, it took possession of the whole movement. But whereas it might have been a good servant it proved to be a bad master. Instead of working in symbiosis with hominal oncology, animal oncology became parasitic upon it, usurping for its own nourishment the labour, ability, and money which would otherwise have been given to the investigation of cancer in man. And now after 30 years of research all that it has to show is a prodigious heap of facts and inductions got by much industry from animal sources, but, so far as man is concerned, no better than a tumour—an innocent tumour—useless to man, and most decidedly of no use to mice. *Parturiunt montes, nascetur mus.*

Although innocent, this useless overgrowth of research could not do otherwise than hamper and obstruct the progress of profitable search. For one thing the existence of a paid specialism must inevitably tend to the formation of vested interests, and to a pontifical or dictatorial attitude on the part of its votaries. Instincts of loyalty will be aroused in defence of research whenever it is attacked. Those within the circle will be inclined warmly to welcome any work conducted on orthodox lines, but to look coldly on or to become hostile to the unorthodox work of "outsiders," the word not being used with a complimentary intent. Books written as the outcome of many years of careful, painstaking study, and generally regarded as not without merit, will be flippantly or even venomously dealt with in what are termed "reviews." On the other hand, much slighter articles written by those within the circle will be lauded to the skies as consummate achievements of heaven-born genius, and not until two or three years have passed by will those who have read these words of praise awake to the fact that the works so ecstatically referred to have already passed into oblivion. Nor is this exaggerated bias necessarily unscrupulous, or the outcome of petty spite in the one case and of gross flattery in the other. It is, no doubt, to a large extent the natural expression of habits of mind acquired in a laboratory atmosphere among narrow, cramping methods of research.

Of the same origin is another trait essentially innocent, but calculated to be hurtful to scientific medicine and to lower its prestige in the eyes of the public. A movement dependent upon public funds can hardly continue indefinitely without some measure of success. Failing this, it is necessary that there should be some other form of encouragement, best of all some expectation of impending success. Nor is there reason to suppose that the time-honoured expedient of the dangling of the carrot, although made use of so freely by research bodies, is consciously intended to mislead the public. Undoubtedly it is a guileless manœuvre, the expression of a genuine heartfelt belief in the ultimate success of the cause.

Finally, research or re-search—i.e., going over the same ground again and again—makes for needless repetition, for stagnation, or for movements in circles. It is largely responsible for the doctrine that work should be done for work's sake, and not with a view to its utility—that the means are of more importance than the end. It is this up and down or circular method, the method of the crank or the treadmill, which no doubt mainly accounts for the fact, otherwise difficult to understand, that laboratory cancer research has gone on for so many years, contentedly grinding out data and spinning inductions without attention being drawn to the fact that it never produces any useful results. And now, after a quarter of a century of research, we can see to what a deplorable waste of energy and ability and money this academic, aimless toil may lead. One useful, if negative, induction however emerges, which is that the problem of the causation of human cancer is not to be solved by experiments on lower animals in laboratories.

Lord Moynihan tells us that the contributions of experimental laboratory methods to the surgery of the stomach (and of other abdominal organs) has been almost negligible, if not positively hurtful; and he resents the superiority claimed by laboratory over clinical workers and their assertions of infallibility. Of the truth of this criticism and of the importance to humanity of right methods of investigation and of forming right perspectives the history and present state of cancer research seem to provide a convincing example.

I am, Sir, yours faithfully,

Reading, Oct. 20th, 1930. HASTINGS GILFORD.

IMPENDING ISCHÆMIC CONTRACTURE.

To the Editor of THE LANCET.

SIR,—In your issue of Oct. 11th Mr. H. P. Nelson describes a case of "obvious fracture at the lower end of the humerus," in which he could feel no radial pulse at the wrist. He reduced the fracture two hours later under an anæsthetic, bent up the elbow to less than a right angle, and strapped it to the chest. There was, he notes, still no radial pulse. After ten hours the whole limb had become swollen from the shoulder to the fingers, the patient was in great pain, and it appeared as if gangrene would ensue. An operation was performed at which it was found that the median nerve and brachial artery were nipped between the surfaces of the fracture. The fragments were gently levered apart and the artery and nerve released. The pulse returned, the swelling subsided, the patient recovered.

I venture to suggest that in no case of fracture of the lower end of the humerus, complicated by obliteration of the radial pulse, is manipulation likely to be attended with success—it may, indeed, be harmful—and that immediate operation should be done. Obliteration of the pulse suggests that the artery is nipped between the bony fragments, and as these have sharp and jagged edges the slightest movement may cause the artery to be torn or even completely severed. But if for some reason it is decided to take this risk and manipulate, then surely if this is not followed at once by return of the pulse at the wrist an operation must be done without waiting. In this case there was a further definite indication that all was not well, that there were soft structures between the fragments, because no crepitus could be felt.

The conclusion which Mr. Nelson draws from the case surprises me. He suggests that in similar cases, to prevent ischæmic contracture, there should be early incision of the deep fascia. Early incision here would have done not the slightest good; before there could be any relief the artery had to be freed from the compressing bones.

I am, Sir, yours faithfully,

PAUL BERNARD ROTH.

Welbeck-street, W., Oct. 17th, 1930.

RECRUITMENT FOR NURSING

To the Editor of THE LANCET.

SIR,—Dr. Esther Carling, in your issue of Oct. 11th, draws attention to the scarcity of entrants to the nursing profession. The fact is that nursing is in much the same plight as other industries, and like

them needs rationalising. Our nursing is acknowledged to be the finest in the world, yet we hear on all sides that its condition is deplorable. Nursing is influenced by the same economic and psychological factors which crop up whenever work has to be done and paid for. We have had cheap and docile labour, now refusing to be cheap any longer and questioning the sanctions for its discipline. Methods of work are too often antiquated, and costly because they waste material, time, and strength.

Dr. Carling says that the doctor depends more and more on the nurse, but what does the doctor want? Does he want a highly trained woman, an expert in that part of the prevention and cure of sickness which he delegates to her, or does he want someone who has spent the larger part of her training not in learning to nurse but in scrambling through the work of the hospital as best she can? Nurses themselves feel bitterly that too often they leave the training school over tired in mind and body, and with insufficient knowledge to be the doctor's right hand in coping with disease. This discontent spreads, and less and less are educated women willing to enter a profession which is so unsatisfying.

Rationalisation means that we determine the course of events and are not determined by them. Let doctors and nurses together convince the public and the hospital committees that the present system is uneconomic. First, we want to know what are the proper functions of a nurse. Secondly, we must decide the number of workers we require, and the grades to which they shall belong: so many for nursing the sick, so many for preventive and educational work. Finally, we must draw up the appropriate training, remuneration, prospects, and conditions of work which will ensure a sufficient supply of suitable labour and keep it contented. Every business firm does this, and scraps its old ideas and its old plant as need arises.

I may be criticised for applying economic conceptions to nursing, but when we have sucked the last bit of sweetness from such words as vocation and self-sacrifice, we still have to face the fact that we all have to work, and the labourer is worthy of his hire. If the economic conditions are such that workers and material yield their fullest product, we are much more likely to get, in addition, that precious part of human effort which neither wage nor salary can command or pay for.

I am, Sir, yours faithfully,

GLADYS B. CARTER, B.Sc. Econ.,
State Registered Nurse, Certificated Midwife.

University Women's Club, 2, Audley-square, W.,
Oct. 20th, 1930.

SOCIETY OF MEMBERS OF THE ROYAL COLLEGE OF SURGEONS.

To the Editor of THE LANCET.

SIR,—Plarr's "Lives of the Fellows," as your reviewer stated in your issue of July 26th, bridges a gap in medical history of great significance, that which divides the pre-Listerian from the post-Listerian surgeons. Much of the evolution of surgery was accomplished by those whose careers are recorded in these volumes. In these pages the biographer and even the philosopher will find many examples of the difficulty in deciding who have been our most useful leaders in a science demanding coöperation above all things.

But it is not in that exalted spirit that I ask for the publication of a few words. Preceding the alphabetical roll, published in the first volume, is a very interesting note, quoted from the pages of THE LANCET; it is the list of original Fellows elected in accordance with the provisions of the Charter of 1843. These excellent people were 300 in number, and it may be noted that their places of residence, which are duly recorded, were largely in the provinces, where few, if any, medical schools existed; 137 lived in London and of these 110 resided west of Temple Bar and 27 on the east side thereof.

Now I am one of those who, since the days when Sir John Tweedy and Sir Victor Horsley led the movement, have considered that to ask for some direct representation of the Members on the Council of the College is reasonable and just. I have received with respect the reply that, to earn their privileges the Fellows must pass a special examination, which gives to them an academic status fitting them to be examiners and also teachers in the schools. In the analysis quoted above I notice that many of the original Fellows were not attached to teaching schools and I also learn from the calendar of the College, and from the statement made by the President at the annual general meeting last year, that the examiners appointed to-day are not necessarily Fellows. A plausible argument thus is lost to those who are of opinion that the claims of the Members are ill-judged, and my hopes rise that success may attend the long-sustained movement for direct representation of Members on the Council.

At 41 annual general meetings this has been urged. In November last the Council passed the following resolution: "No evidence has been submitted to the Council that the change in the constitution of the College advocated in the resolution is desired by any considerable number of the Members of the College and the Council is therefore not prepared to reopen the question at present." In response to this a poll of the Members resident in the United Kingdom and the Irish Free State is being taken by the Society of Members; it is still open but must close on Nov. 7th. More than 50 per cent. replies have been received to the circular, and these replies are practically unanimous.

I ask all those who have not done so to send their voting cards promptly to the Hon. Secretary, Society of Members, 25, Fellows-road, London, N.W. 3, and thus show interest in their College and afford to the Council the evidence required.

I am, Sir, yours faithfully,

ERNEST E. WARE,
Oct. 21st, 1930. President of the Society of Members.

PS.—Those who have not received cards are asked to apply immediately to Mr. H. Pinto-Leite, the Hon. Secretary.

THE STETHOSCOPE.

To the Editor of THE LANCET.

SIR,—In his highly interesting address on the stethoscope, published in this week's issue of THE LANCET, Dr. R. A. Young favours a chest-piece made of wood or ivory rather than of metal as being warmer and more comfortable for the patient. May I point out the superiority of celluloid to any of these materials? It is distinctly warmer even than wood and has the additional advantage of being almost unbreakable. I still have two in use, one of the ordinary size and a smaller one for children, which were made for me by Mr. J. H. Montague many years ago and have outlasted innumerable ear-pieces; they are of the bell-shape which I always think secures a better contact with the skin than the ordinary trumpet end.

I am, Sir, yours faithfully,

Exeter, Oct. 18th, 1930. THOS. WHIPHAM.

PANEL PRACTICE.

General Practitioner Service.

AT a moment when the annual conference of local medical and panel committees is meeting in London under the chairmanship of Dr. H. J. Cardale to discuss the work and status of the practitioner under the Insurance Acts, it may be of interest to recall what is being said outside about his practice and status. It has, we fear, become rather the fashion to sneer at the scheme of medical benefit under the Insurance Acts. Certain recent public utterances have appeared to disparage the scheme not only because it stops short at a general practitioner service and is incomplete as such, but because the service itself is not worth the money expended upon it in times of financial stress such as the present. The Minister of Health recently said it was "a torso of a scheme" unless you could be certain that the insured person was going to have available all the best resources of medical knowledge and medical skill. In his opening address at St. George's Lord Riddell pictured the panel doctor as "a sort of medical slave employed, or at any rate paid, by commercial institutions"; he must prescribe in accordance with certain rules, and the less he did for his patients the easier the time he had. Most of the panel doctor's serious cases, and, he added, a good many that were not serious, were passed on to the out-patient department of the voluntary hospitals, London alone treating every day an average of 1000 out-patients at each of its 12 teaching hospitals, a large proportion of whom were on the panel. It would be interesting, he said, to discover how many of the 14,000,000 panel patients were treated largely at the expense of the charitable public and for what diseases. We on our part would like to know, too, how many of these were referred to hospital with letters from their doctors and how many went to hospitals on their own account. Various attempts have been made to convert hospital out-patient departments to their proper function of consultative centres, but these all break down if the secretary or treasurer of a voluntary institution in appealing to the charitable public requires impressive statistics showing how many patients are treated at his institution every minute of the day.

How is the practitioner to treat his serious cases adequately at home when home conditions and the lack of skilful nursing jeopardise the successful issue of his treatment? Even when laboratory and consultative facilities have been provided, institutional treatment will still be necessary in the interests both of the patient and the community. When, however, the new scheme of local hospitals is fully developed, the practitioner will be eager enough to take his part in the provision and treat his patients in hospital himself. It was the veteran ophthalmologist, Prof. Priestley Smith, who in his presessional address at Birmingham had a truer vision of a general practitioner service. It was, he said, the practitioner who saw the habits of the people and the beginnings of disease, who could step in early and prevent mischief, who when special skill was required knew what sort was needed and where to get it. In his opinion the health of the community in the future would lie largely in the hands of the general practitioner. The practitioner has been spoken of as a signpost, and what more useful function could he serve? Disease is the divergence from the path of health, and the practitioner's highest duty is to discover the whereabouts of the lost traveller and help to put him on the right road again.

OBITUARY

JAMES PAUL BUSH, C.M.G., C.B.E., Ch.M. Bristol.

WE much regret to record the death of Colonel Paul Bush which occurred on Oct. 7th at Clifton in the seventy-fourth year of his age. Alike as clinical surgeon and an authority on military medicine it is a professional leader whom death has removed from among us.

James Paul Bush was born at Brislington in 1857, the son of Major Robert Bush. He was educated at Clifton College and the medical school in Bristol, completing his curriculum at University College, London. He qualified M.R.C.S. Eng. in 1881 and L.S.A. the following year, and, returning to Bristol, became house surgeon at the Royal Infirmary and demonstrator of anatomy in the Bristol Medical School, where he had himself previously won gold medals for distinction both in medicine and surgery. Then followed three years as resident medical officer at the infirmary; in 1885 he was appointed assistant surgeon to the institution, and four years later full surgeon. He thus had been for over 30 years an honorary officer of the infirmary when, in 1913, having reached the age limit, he was elected honorary consulting surgeon. In 1912, with the founding of Bristol University, he received the honorary degree of Ch.M. His work at the infirmary commanded universal esteem; he was a fine general surgeon, progressive in view, and quick to appreciate developments and to employ them practically. He did not write much, save in the columns of the *Bristol Medico-Chirurgical Journal*, to which, especially early in his career, he was a constant contributor, but occasional communications to *The Lancet* and the *British Medical Journal* bore the imprint of his practical knowledge.

Paul Bush had a fine military record. From boyhood he had been a Volunteer, and had served as surgeon in a battalion commanded by his father, so that it was natural that he should be among the earliest volunteers for medical service on the outbreak of the South African War. He was appointed surgeon to the Princess Christian Hospital of the Natal Field Force, of which he became commandant, and later he received charge of a large hospital ship, the *Lismore Castle*, as P.M.O. The efficient manner in which he discharged these duties was recognised by Lord Roberts, and Bush received the C.M.G. On the institution of the Territorial Force he was appointed to the command of the Second Southern General Hospital. Here his keen interest in military medicine, and his general foresight, proved of great value, for six years later, when the European War broke out, the Second Southern General Hospital was found to be fully equipped in a remarkably short space of time, with over 500 beds ready for occupation, situated partly in a wing of the Royal Infirmary and partly in the poor-law hospital at Southmead which had recently been erected. As a commanding officer he was seen immediately to be in his place; his scientific knowledge was sound, while his administrative ability was great and guided by considerable personal experience of the events of war. In the third year of the struggle he went to France in command of Number 56 General Hospital,

which was located at Etaples, and, it may be remembered, was subjected frequently to severe bombing. He remained in command until late in 1918 when he was appointed A.D.M.S. to the second area of the Southern Command. This excellent record of service was acknowledged when he was awarded by the King of the Belgians with the Order of Officier de la Croix de Courage. He was also appointed C.B.E.

Although so identified with the Royal Infirmary Colonel Bush found time for valuable association with other public affairs. He had been chief surgeon to the Bristol post office and Bristol police, and was a past president of the Police Surgeons' Association. He was hon. consulting surgeon to Almondsbury Memorial Hospital and Pontypool Hospital, vice-president and member of the Council of Epsom College, member of Council of the International Surgical Society, and ex-president Bath and Bristol branch, British Medical Association.

Colonel Bush married in 1887 Laura Annie, daughter of the late John Robertson, of Colac, Victoria, Australia, and leaves a widow, a son, and a daughter.

MEDICAL NEWS

University of Oxford.

On Oct. 16th the following degrees were conferred :—

D.M.—Janet M. Vaughan.
B.M.—Amy C. E. Clarke and Victoria M. Robinson.

University of Cambridge.

On Oct. 17th the following degrees were conferred :—

M.D.—E. G. Holmes.
M. Chir.—C. I. Tuckett.
M.B. and B.Chir.—A. J. Johnson, G. A. Eason, and G. O. Barber.
M.B.—*W. J. H. M. Beattie, A. M. Roberts, A. H. Birks, and I. J. Franklen-Evans.
B.Chir.—*A. H. Gurney and A. F. Alsop.

* By proxy.

Scottish Conjoint Examining Board.

The examinations of the Board of the Royal College of Physicians of Edinburgh, the Royal College of Surgeons of Edinburgh, and the Royal Faculty of Physicians and Surgeons of Glasgow, have just concluded at Edinburgh. Out of 78 candidates entered, the following passed the final examination and were granted the licentiates' diploma.

Jean G. Clark, W. G. Harding, Frances K. Harding, David McNair, R. W. van Cuijlenburg, Vytilingam Sivalingam, D. D. Steele-Perkins, K. L. Loh, W. G. Pennington, W. P. Shand, M. K. Thiruvilangam, Y. M. E. R. Abeyesundere, M. S. Golding, W. E. S. Winn, Gavin Brown, J. B. D. Oliver, A. J. Abeyesundere, Leonard Baumann, K. C. S. Menon, J. L. K. Lawson, N. Y. Labib, H. L. Ong, M. N. Rozdon, R. T. A. Morrow, A. I. Foster, and A. G. Daly.

Royal College of Surgeons of Edinburgh.

At a recent meeting of the College, with Dr. James Haig Ferguson, the President, in the chair, the following 48 successful candidates (out of 106 entered) who passed the requisite examinations between July 10th and 19th were admitted Fellows :—

Ian Aird, Frederick Alfred Blackwood, Reynold Harold Boyd, Alexander Mackay Calder, Geoffrey Alleyne Cook, Mehra Maneckji Dalal, Willem Frederik De Villiers, Joseph Butler Dobson, John Cornell Drummond, John Phillips Fairley, Ivor Burberow Gardiner, Maynard Atkinson Gerrard, St. George Bernard Delisle Gray, Brenda Gladys Hallett, Anthony Morrice Hendry, Reginald Manson Hill, Lionel Lazarus Hurwich, John McQueen Johnston, Alan Stewart Johnstone, Ramrau Annappa Kalle, David Glyn Lamond Lackie, Robert Mitchell Marshall, David Skene Middleton, John Reginald Miller, Hugh Glasson Mitchell, Henry Newman Mortensen, Geoffrey Moulson, Allan Henry Mowat, Ratanshaw Pirojshaw Munshi, Norman Arnold McCormick, Donald Murray Mackay, Clarence Wilmott Olsen, Lloyd Reath Olver, Frank Young Pearson, Maitland Boyd Perrin, Archibald Ronald, Gordon Islay Scott, Angus Leslie Sutherland, Dick Brasnett Sutton, John Swan, Charles Frederick Swinton, Bhagat Ram Tandan, Robert Lindsay Turner, Gobind Vaishnavi, Arthur Walbank, Harry Caldecott Warner, and Brian Wellingham Windeyer.

Dr. Ferguson was re-elected President for the ensuing year, Mr. Alexander Miles Vice-President, and Mr. J. W. Struthers Secretary and Treasurer.

Bridge of Allan Spa.

Sir Humphry Rolleston will open this spa on Oct. 30th at 12 noon.

Chelsea Clinical Society.

The annual dinner will take place at the Hotel Rembrandt, Thurloe-place, London, S.W., on Tuesday, Oct. 28th, at 7.30 for 8 P.M. The President, Mr. F. J. McCann, will be in the chair.

The Semon Lecture.

Mr. V. E. Negus will deliver the Semon Lecture at 1, Wimpole-street, on Thursday, Nov. 6th, at 5 P.M. (tea 4.30). The title of the lecture is Some Observations on Semon's Law (derived from evidences of comparative anatomy and physiology).

Halley Stewart Lectures.

Four free lectures on Health and Social Evolution will be given by Sir George Newman at the Memorial Hall, Farringdon-street, London, E.C. (Ludgate Circus), on Nov. 4th, 6th, 11th, and 13th, at 6 P.M. The address of the Halley Stewart Trust is 32, Gordon-square, W.C.1.

London School of Hygiene and Tropical Medicine.

The programme of special lectures arranged by Prof. W. W. Jameson at this school in connexion with study for the Diploma in Public Health has now been issued. These lectures are open to all interested in public health. The names of the lecturers and their subjects will appear in our Medical Diary.

Physical and Psychological Defects.

On Nov. 13th and 14th the Invalid Children's Aid Association and the Central Council for the Care of Cripples will hold a joint conference on Problems relating to those Handicapped by Physical and Psychological Defects. The conference will meet at the Drapers' Hall, Throgmorton-street, London, E.C., and the opening address will be given by Mr. Arthur Greenwood, Minister of Health. The chairmen for the four sessions will be Sir Robert Jones, Sir George Newman, Lord Amulree, and Dr. Ralph Crowley. The speakers will include Dr. S. J. C. Holden, Dr. F. J. Poynton, Dr. F. Carey Coombs, Dr. B. E. Schlesinger, Dr. J. F. Ward, Dr. P. C. Varrier-Jones, and Dr. G. A. Auden.

London Hospital Dinner.

Presiding over the old students' dinner at the Trocadero Restaurant on Oct. 16th, Sir Wilfred Grenfell spoke of his early days at the London Hospital and especially of Sir Frederick Treves who had first persuaded him to go out as surgeon on the North Sea mission. It was difficult in those days, he said, to be associated with anything religious or even altruistic, and on returning to London in the train after presenting prizes to skippers whom the speaker had trained in ambulance work, Treves was greeted by a fellow traveller with a single curt sentence : " Doing a little more damned advertising, I see." After expressing regret that no one had yet written Treves's life, Sir Wilfred went on to speak of old friends at the hospital He was glad to see beside him Dr. Percy Jackson and Dr. Arthur Wakefield, both of whom had worked on the Labrador Coast. They could testify that medicine over there was on the same lines as it was in England. Dr. Lewis Smith referred to the chairman's early achievements as footballer, boxer, and oarsman, and described him as always an outdoor man, as hard as nails. Research in the Medical College revealed that the student Grenfell had attended as post-mortem clerk on only two occasions ; on the other hand, he had 99 maternity cases to his credit—surely a strange figure? Dr. Lewis Smith recalled his own experiences as surgeon on the Deep Sea Mission to Seamen, when he was out of sight of land for eight weeks and grew a beard. Sir Wilfred's achievements in Labrador amazed him. No one who had not seen that country could have any idea what it meant to persevere there, in a land bigger than France and Britain combined, with 1,100 miles of seaboard. It was not surprising that Grenfell's name was one to conjure with in America and that everywhere he was held in respect above other men. This " dynamo in trousers," as he had been called, was one whose motto was always Safety Last.

After Sir Wilfred had responded to the toast of his health, drunk with music and sincerity, there was a general demand for a speech by Dr. Russell Andrews, who replied with further reminiscences of Treves. Dr. Robert Hutchison (answering to the toastmaster's call of " Mr. Hutchinson ") said that, like the Scots minister, he must just put his faith in Providence, and next time he would come better prepared. But not even the signal triumph of Dr. Hutchison's faith persuaded Mr. Russell Howard to rise upon a similar venture.

Medical Golfing Society.

The autumn meeting was held at Littlestone on Oct. 18th and 19th, 75 competitors taking part. The results were as follows:—

Singles *v.* Bogey: 1st, Mather Thomson (2 up); 2nd, A. Galletly. Foursomes *v.* Bogey: D. J. O'Keeffe and H. W. Molesworth (all square) after a tie with Commander Rusack and A. Galletly. Canny Ryall Cup: 1st, D. Ligat, 73 net; 2nd, Eric Dobson and T. A. Torrance, 74 net; Scratch Prize: T. A. Torrance, 71. Veteran's Cup: D. Ligat.

London Irish Medical Golfing Society.

The autumn meeting was held at Sandwich on Oct. 11th. About 65 players took part. The results are as follows:—

Captain's Prize (best gross scores for 36 holes): E. T. Wright, 163; D. J. O'Keeffe, 165; A. G. Walsh, 168.

Cahill Trophy (best net scores for 36 holes): F. J. Holmes (18), 155; R. H. Jones (17), 156.

Lett Cup (foresomes): D. S. Gordon and G. Campell, 3 up; A. G. Walsh and W. Macauley, 1 up.

O'Malley Cup: G. Sneyd (14), 2 up; R. Seale (8), 1 up.

Canny Ryall Cup: J. Maybury (16), 72; E. M. Donahue (15), 75; M. J. Smythe (6), 75.

Medical Diary

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
MONDAY, Oct. 27th.—8 P.M., ODONTOLOGY. Presidential address: Mr. Carl Schelling: The Odontological Society in the last Decade of the Nineteenth Century. Members are invited to contribute matters of interest arising from the paper.
TUESDAY.—5 P.M., MEDICINE. Discussion on Research in Clinical Medicine. Openers: Dr. J. A. Ryle, Prof. H. Moore, and Dr. Helen Mackay.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.
MONDAY, Oct. 27th.—8.30 P.M., Discussion on The Prophylactic and Therapeutic Values of Vaccines, to be introduced by Sir Almroth Wright.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, Oct. 27th to SATURDAY, Nov. 1st. MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W., Special M.R.C.P. Lecture at 8.30 P.M. as follows:—Tues., Dr. Donald Hunter: Prevention of Disease in Industry. Pathogenesis and Treatment of Lead Poisoning. Fri., Dr. Maurice Cassidy: Coronary Occlusion. Mon., at 4 P.M., a free lecture by Sir James Purves-Stewart: Diagnosis and Treatment of Disseminated Sclerosis.—MILLER GENERAL HOSPITAL, Greenwich, S.E. Thur., 11 A.M., Mr. R. C. Ledlie: Injection Treatment of Varicose Veins. Free demonstration.—HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C. Special Course consisting of lectures, demonstrations, operations from 10 A.M. to 1 P.M. daily.—ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, 234, Great Portland-street, W. All day course.—ROYAL WESTMINSTER OPHTHALMIC HOSPITAL, Broad-street, Holborn, W.C. An afternoon course.—Further particulars from the Fellowship of Medicine.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
MONDAY, Oct. 27th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.
TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Ear, Nose and Throat Clinics. Operations.
WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.
THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, Throat, and Ear Clinics. Operations.
FRIDAY.—10.30 A.M.: Ear, Nose, and Throat Clinics. 2.30 to 5 P.M.: Medical, Surgical, and Children's Diseases Clinics. Operations.

NATIONAL HOSPITAL, Queen-square, W.C.
MONDAY, Oct. 27th.—12 noon, Dr. Greenfield: The Neuroglia. 2 P.M., Dr. Riddoch: Out-patient Clinic. 3.30 P.M., Mr. Williamson Noble: Canges in the Visual Fields.
TUESDAY.—2 P.M. Dr. Walshe: Out-patient Clinic. 3.30 P.M., Dr. Bernard Hart: Some Aspects of the Psychoneuroses.
WEDNESDAY.—2 P.M., Dr. Purdon Martin: Out-patient Clinic.
THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Mr. Just: Physiology of the Vestibular Apparatus.
FRIDAY.—2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Sir Percy Sargent: Spinal Tumours.

KING'S COLLEGE, Strand, W.C.
THURSDAY, Oct. 30th.—5 P.M., Mr. J. A. Hewitt, Ph.D.: Metabolism of the Carbohydrates and Fats (third of four free lectures).

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL, Denmark-hill, S.E.
THURSDAY, Oct. 30th.—9 P.M., Dr. Terence East: Some New Points in the Treatment of Cardiac Disease.

UNIVERSITY COLLEGE, Gower-street, W.C.
MONDAY, Oct. 27th.—5 P.M., Dr. H. P. Gilding: The Reticulo-endothelial System (third of four free lectures).

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION St. James' Hospital, Ouseley-road, Balham, S.W.
WEDNESDAY, Oct. 29th.—4 P.M., Mr. V. Zachary Cope: Demonstration of Surgical Cases

ST. PAUL'S HOSPITAL, Endell-street, W.C.
WEDNESDAY, Oct. 29th.—4.30 P.M., Mr. Stanford Cade: Some Points on Radium Therapy.

CHADWICK PUBLIC LECTURES.
THURSDAY, Oct. 30th.—5.15 P.M. (in the Hastings Hall, B.M.A. House, Tavistock-square, W.C.), Dr. Gerald Slot: Rheumatism, Cause and Prevention.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.
WEDNESDAY, Oct. 29th.—4 P.M., Lt.-Col. J. A. A. Pickard: The Prevention of Street Accidents.
THURSDAY.—4 P.M., Dr. C. P. Blacker: Sterilisation of the Unfit.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.
TUESDAY, Oct. 28th.—4.15 P.M., Dr. A. Ramsbotton: Visceroptosis.
FRIDAY.—4.15 P.M., Dr. R. S. Davidson: The Complications and Treatment of Puerperal Fever.

ANCOATS HOSPITAL, Manchester.
THURSDAY, Oct. 30th.—11 A.M., Dr. G. J. Langley: Clincial Demonstration. 4.15 P.M., Dr. W. J. S. Reid: Disorders of the Autonomic Nervous System.

Appointments

BROADFOOT, J. M.D., Ch.B. Glasg., has been appointed Medical Officer of Health, Inverness.

DIXON J. H., M.D., C.M. Edin., a Medical Referee under the Workmen's Compensation Act for the District of Marylebone County Court.

GARLAND, H. G., M.D. Leeds, M.R.C.P. Lond., Resident Medical Officer, Leeds General Infirmary.

MACMURRAY, S. M., M.B., Ch.B. Glasg., and WHITEFORD, C. M., M.B., Ch.B. Glasg., Assistant Medical Officers of Health, Paisley.

MACRAE, A., M.D., Ch.B. Edin., and HIGHAM, J. P., M.B., B.S. Durh. (extended appointment) Medical Referees under the Workmen's Compensation Act for ophthalmic cases in the districts of Barnard Castle, &c., and Sunderland County Courts.

NELSON, H., M.B., Ch.B. Dub., Medical Officer, Clogher Dispensary.

NELSON, MARGARET M., L.R.C.P. & S.I., Medical Officer of Clogher Union Hospital.

SMITH, H. S., M.R.C.S., L.S.A., Certifying Surgeon under the Factory and Workshop Acts for Littlehampton.

Births, Marriages, and Deaths

BIRTHS.

PENNY.—On Oct. 13th, at Roxeth Vicarage, Harrow, the wife of Dr. H. J. Penny, of a son.

TERRY.—On Oct. 7th, at Nyaunghla, Upper Burma, the wife of Dr. Gordon S. Terry, of a son.

MARRIAGES.

BRIGG—JACKSON.—On Oct 16th, at Radley Church, Denis Anderton Brigg, M.B., to Eva Katharine Mary, elder daughter of Rev. A. A. and Mrs. Jackson, of Radley.

CROSBIE—MC'LEISH.—On Oct. 11th, at All Souls' Langham-place, Surgeon Lieut.-Comdr. John H. B. Crosbie, R.N.B., Chatham, to Alexandra Victoria, daughter of Mrs. Mc'Leish of Sydney.

DEATHS.

EXHAM.—On Oct. 19th, at Stafford House, Market Drayton, Arthur Richard Frederic Exham, M.D., aged 73.

HARVEY.—On Oct 13th, at 43, Holland-street, John Owen Harvey, M.D.

HAYES.—On Oct. 19th, Francis George Hayes, M.R.C.S., L.R.C.P., aged 75 years.

JAMES.—On Oct. 18th, at St. Mawes, Cornwall, Frederick Charles JAMES, M.B., aged 59.

MOTTRAM.—On Oct. 14th, at The Grange, Salhouse, Norfolk, Guy N. Mottram, M.R.C.S., L.R.C.P., of Preston, Lancs, aged 56.

PAYNE.—On Oct. 14th, William Henry Payne, M.D., aged 60.

WITHERS GREEN.—On Sept. 25th, at Sandy Bay, Hobart, Tasmania, Alfred Withers Green, M.R.C.S., L.R.C.P., aged 76.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

NOTES, COMMENTS, AND ABSTRACTS

INDUSTRY AND THE PUBLIC HEALTH.*

BY A. MASSEY, M.D. LEEDS, D.P.H.,
MEDICAL OFFICER OF HEALTH FOR THE CITY OF COVENTRY.

HEALTH is indispensable above all to those involved in the rigours and competition of modern industrialism. The Romans, 2000 years ago, knew the value of communal hygiene, and employed officers whose duties were concerned with health and sanitation. It is strange that in this country the history of organised health endeavour goes back but 60 or 70 years. The names of Chadwick and Simon readily suggest themselves among the pioneers. Some of the earliest efforts in public health and social welfare were directed towards factory hygiene and against child labour. The Public Health Act of 1875 marked the widening dawn of the health movement, and the last half century has seen a mass of legislation on behalf of communal health. The achievements of the public health service during this decade can be accurately measured by a careful consideration of comparative vital statistics; suffice it to say here that the average duration of human life in this country has been extended by some nine years since the service began generally to operate. Moreover, this increased span is spent in greater physical comfort than was at one time possible or even conceivable.

The activities of the health officer were formerly concerned with the environment rather than with the person. To-day the person receives first attention, although environmental hygiene must needs continue an important concern. Health work in factories is similarly divisible into personal and environmental, although the two are closely interconnected. Man is largely the slave of his surroundings. His mentality and outlook are largely influenced by them, as are his physique and state of health. It is better to adjust environment to man than man to environment. When it is borne in mind that an artisan spends one-third of his effective adult life in his place of work, the importance of a clean, light, and airy factory is readily apparent. It is clearly to the interests of the industrialist to accord a cheerful and sanitary environment to his employees. Such provision is likely not only to conduce to health but also to contentment. Industrial unrest is, in some measure, a psychological reaction to depressing environment.

Occupational Selection.

Occupation exercises a degree of selection on its entrants. It is natural that the physically subnormal should turn to vocations calling for little in the way of bodily strength. For this reason coal miners, for example, despite the health hazards with which they are beset, are generally men of good physique. Discrimination by occupation alone, however, can be but an approximate rule.. A medical system of scientific selection of employees is the best way of preventing ill-health consequent upon unsuitable work.

The engineering and motor industries are not free from occupational health hazards, accidental injuries apart. Sand-blasting and grinding are processes involving the emanation of sharp particles of dust which, inhaled, are liable to cause abrasion of the respiratory tissues with resultant bronchial or lung disease. My department not infrequently meets with cases of phthisis in sand-blasters. In some of the Coventry works fine shot is used in lieu of sand in the sand-blasting process, and it is possible that this might mitigate the danger of respiratory disease. Lead poisoning may arise from car-body painting, and chrome poisoning from chromium plating. Cellulose-spraying may give rise to benzene poisoning, and it is possible that the inhalation of certain other constituents of cellulose over a period may cause respiratory and cardiac troubles. All possible preventive measures against these contingencies are in operation by order of the medical department of the Home Office.

Monotony of work is a potent cause of nervous breakdown. This is well illustrated by experiences in certain large motor works in America, where systems are in operation which impose on groups of workers the circumscribed duty of fitting one small part to each of the embryo cars which are passed in line before them. There is no mental satisfaction in such work, and the engineer's constructive instinct finds no scope. This happily does not apply to the same extent in British motor works. The matter is nevertheless of considerable interest. Small changes from time to time in the nature of a man's work are most likely to obviate the contingency of nervous breakdown.

The Importance of Common Illnesses in Industry.

Industrial medicine has hitherto embraced chiefly the matters of factory environment, occupational diseases, and accident prevention. It is well, however, in considering the incidence of physical disability in factories to preserve a due sense of proportion. It is everyday sickness, rather than occupational disease or accidental injury, that constitutes the greatest time-loser in groups of occupied persons. It is probably true to say that, in the aggregate, for every week of working time lost through occupational or accidental damage, a half-year's suspension from work results from ordinary or epidemic sickness; the visitation of influenza in early 1929 is a case in point. It is in this connexion that great scope presents itself for more organised preventive effort. During 1928 in this country a total of 26,750,000 weeks' sick benefit was recorded, involving payment of £15,600,000. Coventry had an insured population, as at June, 1929, of 67,984 persons. On the basis of the above, this means the annual loss in the city, through sickness, of 704,314 working days, or an average of 10·36 days of sickness on pay per year per insured person. Sickness benefit does not begin until the fourth day of illness, so that the average period of suspension from work in a year per insured person totals 13·36 days. The nature of the more common illnesses causing this serious loss of productive time are: colds, bronchitis, and catarrhal conditions, 21·37 per cent.; digestive troubles, 12·61 per cent.; rheumatism, 9·78 per cent.; injuries and accidents (not necessarily sustained at work), 9·78 per cent.; septic skin conditions, 8·43 per cent.; influenza, 7 per cent.; nervous troubles, 5·9 per cent.; and neuralgia, headaches, and debility, 5·39 per cent. Many of these conditions are largely preventable, and in work to that end the interests of the employer are directly involved. A maximum return for wages paid can only be obtained from a healthy staff. Output is proportional to the available mental and physical energy of the operative. Apart from humanitarian considerations, then, there is strong economic inducement to the employer to provide medical and social services for his employees. In these days one hears so much of alleged divergent interests as between employer and employee, that it is a real pleasure to present a case which is accepted as advantageous alike to master and man.

Welfare Schemes.

In the factory, as out of it, health education is of fundamental importance. Whatever is done by the various health agencies for the individual, he himself is not uncommonly the final arbiter in regard to his state of health. In short, one can prescribe medicine

* Based on a paper to the Coventry Engineering Employers' Association.

for a man but one cannot make him take it. It is by educative work only that the man in the street—or factory—can be induced to coöperate with those working on his behalf. It is clear that health propaganda should be a feature of the industrial welfare scheme. More might be done on these lines.

Welfare schemes are admirably conducted in certain works. I rather think that a defect in the system is the want of a more defined contact between welfare and preventive work in the factory and the work of the city health department. In epidemic times, especially, such liaison is indispensable. The machine of preventive medicine is complete in respect of its component parts. Whether or not these parts are correctly assembled—as, of course, they must be to ensure smooth and efficient working—depends upon the degree of coöperation between the various workers in similar fields. Home hygiene and factory hygiene, for example, lose value by divorce one from the other. Further, some degree of continuity in the personal side of health work, through the child welfare and school medical schemes into factory life, is desirable.

A Threefold Aim.

Industrial medicine seeks to find complete answers to the following questions, viz.:—

1. How are disease and accidents among workers to be, as far as possible, prevented?
2. How are healthy employees to retain their mental and physical capacity?
3. How are the sick to be treated in order that they may return in health, with reasonable expedition, to productive work?

Let us assess the present position. Environmental hygiene in the factory is provided for. Reasonable safeguards in respect of accidents and occupational health hazards are in operation. The last-named contingencies, however, are not more important than those of ordinary and epidemic sickness in the matter of loss of output and working time. The latter fact rather indicates the lines of future development in industrial welfare work. In this connexion, scientific selection of employees has far-reaching possibilities. Health education in the factory is fundamental, for only by this means can the individual be induced to help himself by ready compliance with welfare measures. Liaison between the factory welfare scheme and the local health service is eminently desirable. Great opportunity for medical endeavour is here presented—preventive, curative, and educative.

I cannot miss this opportunity of reference to the matter of smoke abatement. Preparations are now in progress to celebrate in 1931 the centenary of Faraday, the father of electricity. Faraday was an important, if indirect, pioneer in public health. He made clear skies possible in industrial areas. I need not enlarge on the many ways in which smoke is injurious to health; suffice it to say that atmospheric pollution is a detrimental factor of the first importance. Smoke means incomplete combustion of fuel, and thus represents financial waste. On economic and health grounds, therefore, there is every inducement to the industrialist to secure smoke abatement.

Disraeli said that public health is the foundation on which repose the happiness of a people and the power of a nation. To apply this to my present thesis, I would say that health in the factory is the foundation on which repose the happiness and efficiency of the employee and the competitive power of an industry.

SOCIETY OF RADIOGRAPHERS.

PRESIDENTIAL ADDRESS.

THE Society of Radiographers was founded in 1920, and until that time radiographers had been a scattered body suffering under many disadvantages. Mr. C. L. Winch, the newly-elected president, in the course of an address delivered on Oct. 15th at the Reid Knox Hall, Welbeck-street, said that a great debt was owed to the Institute of Electrical Engineers which had undertaken much of the preliminary labour required for the legal constitution of the Society of Radiographers. He regretted that the Institute was no longer represented on the council of the Society, and hoped that in the future this would be remedied. In 1927 the Society had become affiliated to the British Institute of Radiology. Speaking of the Articles of Association, he said that the first of these required that the Society should promote the science and regulate the practice of radiography, and this ideal had inspired the papers and discussions at the monthly meetings. An important point gained by the activities of the Society was the inclusion of radiography as a dangerous occupation under the Workmen's Compensation Act. Examinations in radiography were held under the auspices of the Society not only in England, but in Australia, South Africa, China, and Ceylon. Reports of the work of the Society and of individual members were published in the official journal, and a section of the *British Journal of Radiology* was devoted to radiography; recently the American Society of Radiographers had opened the pages of their journal to the British Society. Up to the present it had been possible to do little to encourage research, but it was hoped that later grants and scholarships might be given. A library and a museum were maintained for the use of members. The formation of a benevolent fund was as yet beyond the means of the Society, but it was in the minds of council and would not be forgotten. It had not been necessary for the Society to build an institute up to the present, since the Institute of Radiology lent a room for its meetings. Investments had now reached the sum of £1400, a good record for an existence of only ten years.

THE DEVELOPMENT OF RADIOGRAPHY.

Mr. E. C. Jerman, president of the American Society of Radiographers, delivered an address on the development of radiography, not from the point of view of equipment and practice, but from that of technique. Improvement of equipment, he said, meant improvement in technique. At first the radiologist had been his own radiographer, but this plan had been subject to many disadvantages, and had met with little financial success. These workers had been pioneers. As time went on, non-medical assistants were introduced to help with the equipment, and as the value of X rays became more evident, the X ray technician or radiographer was introduced. The radiologist was, of course, the leader of this group of workers, but the best results were only obtained by close coöperation of all its members. Gross pathology could be shown by ordinary radiography, but for finer pathology radiography must reach a high standard. More than a hundred factors were involved in the production of a good radiogram; in the early days guess work could not be excluded, and radiologists worked on what he might term the "hunch" method. The increasing volume of work led to delegation of a part to lay workers, and as these required training, there was for a time a dearth of assistance. Fifteen years ago he had been asked to help to solve this problem of training; he had found it could best be done by grouping the various points in technique under different headings, and teaching one group at a time. Alterations had to be made in equipment; measurements of time and dosage required to be more accurate; fractional-second time switches were introduced and a better method of measuring voltage. It was realised that the price of inaccurate equipment had to be paid many times in delay, and reduction in quality of the work done. Faulty dark-room technique often wrecked good operative work. Methods for the protection of operator and patient, the position of the patient, and the effect of emotion in the patient had all to be given due consideration. The patient was, in any case, a variable factor, and deviations from the normal were inevitable and could not be anticipated; it was for this reason that rule-of-thumb methods could not be employed in radiography. Much yet remained to be done; there was opportunity

for wide research in radiography; manufacturers must produce cheaper and better equipment; radiographers must continue to follow closely the instructions of the radiologist, and the radiologist must coöperate with his co-workers to produce the best results. The elimination of frauds, shams, misrepresentation and incapacity, and the establishment of better coöperation would improve the standard of a branch of medical work which must inevitably increase in volume. The customs of the Society of Radiographers in the United States differed a little from those of the English body; the local organisations met once a month at some place where equipment was available. Any technical problems encountered by the members were then attacked, and members of the Society of Radiologists often attended to advise and assist. On one occasion members brought their screens to the meeting to test them; many defects were detected and an examination of time-switches at another meeting brought to light several gross errors. On a third occasion, every member was asked to produce a beetle or other insect at the meeting, and interesting radiograms were obtained. X ray work was, of course, invaluable in museums, since the objects could be magnified to eight times the original diameter.

ACCIDENT OUTFIT FOR MOTORISTS.

THE medical motorist is often unable to do much for the victims of an accident because he lacks the dressings and applications urgently required. The situation of the workman thus deprived of his tools may be very distressing, and as a small insurance against avoidable disaster it would be well if every motor-car were furnished with a first-aid outfit.

Messrs. C. J. Hewlett and Son, Ltd. (35, Charlotte-street, London, E.C.2), have made up a boxful of things a practitioner is likely to find useful if suddenly called upon to attend on road casualties. Their Motor Car Emergency Case is made of japanned tin and is small enough to be stowed away in a car-pocket or in the tool-box. It contains the following requisites:—

Sal volatile in 1-oz. stoppered bottle; 1 oz. absorbent wool; 1 oz. surgeon's lint; tin of vaseline; glass pencil containing iodine tincture, in metal case; tin of rubber adhesive plaster 1 yd. by 1 in. wide; tin of assorted sizes safety pins; pair of scissors, blunt and sharp points, 5 in. long; pair of artery forceps, which can also be used as tweezers; tourniquet; bleached water dressing bandages, 2½ in., 2 in., and 1 in.; ½ yd. packet acriflavine or picric gauze; 1 oz. ung. terebeni co., for burns, in china pot; packet of battiste, 9 in. by 9 in.

This collection which is sold at 18*s.* 6*d.*, can, of course, be modified by the owner to suit his own views but it forms the basis of a valuable and convenient outfit.

Vacancies

For further information refer to the advertisement columns.

Bangor, Caernarvonshire and Anglesey Infirmary.—H.S. £200.
Barbados.—Chief Medical Officer. £1000.
Barnsley, Beckett Hospital and Dispensary.—Jun. H.S. £140.
Bath, Royal United Hospital.—Two Hon. Surg.'s.
Birmingham City.—Asst. M.O.H. for Maternity and Child Welfare. £600.
Birmingham, Dudley-road and Selly Oak Hospitals.—Asst. Pathologist. £500.
Birmingham, Ear and Throat Hospital, Edmund-street.—4th H.S. to Out-patient Dept. £150.
Birmingham, P.H. Dept., Tuberculosis Centre.—Asst. M.O. £400.
Birmingham, Selly Oak Hospital.—Surgeon. £700.
Bradford, Royal Eye and Ear Hospital.—Jun. H.S. £150.
Bradford Royal Infirmary.—H.P. and H.S. Each £150.
Brighton, Royal Sussex County Hospital.—Asst. Pathologist to Special Depts. £400. Also H.P. £150.
Brighton, Sussex Maternity and Women's Hospital.—Res. H.S. £130.
Burnley, Victoria Hospital.—H.P. At rate of £150.
Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.—Hon. Asst. to Out-patient Dept. Also Res. H.S. At rate of £75.
Charing Cross Hospital, W.C.—Res. M.O. £350.
Children's Hospital, Hampstead.—Res. M.O. At rate of £100.
Clapham Maternity Hospital, Jeffreys-road, S.W.—H.S. £120.
Connaught Hospital, Orford-road, E.—Res. H.S. At rate of £100. Also Hon. Visiting Dental Surgeon.
Coventry and Warwickshire Hospital.—Res. Asst. H.S. £125.
Doncaster, Royal Infirmary.—Jun. H.S. At rate of £175.
Dreadnought Hospital, Greenwich.—Physician to Out-patients. Also Asst. Radiologist. 50 gns.
Dukinfield Borough and Hollingworth Urban District.—M.O.H. £800.
East Ham Memorial Hospital, E.—Hon. Surg., Hon. Phys. Also Hon. Radiologist.
East London Hospital for Children and Dispensary for Women, Shadwell, E.—Physician. Also Asst. Physician.
Great Yarmouth General Hospital.—Jun. H.S. At rate of £140.
Harrogate Infirmary.—Sen. H.S. £150.
Hastings, Royal East Sussex Hospital.—Sen. and Jun. H.S. At rate of £150 and £100 respectively.
Hereford, Herefordshire General Hospital.—Hon. Phys.
Heston and Isleworth Urban District Council.—Obstet. Phys. 3 guineas per session.
Hospital for Sick Children, Great Ormond-street, W.C.—Dental Surgeon.
Indian Red Cross Society, King George Thanksgiving (Anti-Tuberculosis) Fund.—Organising Secretary. Rs.750–1250 per month.
Ipswich, East Suffolk and Ipswich Hospital.—H.S. £120.
Italian Hospital, Queen-square, W.C.—Sen. H.S. At rate of £150.
Kidderminster and District General Hospital.—H.S. £150.
Lancashire County Council, High Carley Sanatorium, near Ulverston.—Temp. Asst. Tub. M.O. £450.
Liverpool, St. Paul's Eye Hospital, Old Hall-street, —H.S. At rate of £120.
Llangwyfan, near Denbigh, North Wales Sanatorium.—Third Asst. Res. M.O. £250.
London Hospital, E.—Med. First Asst. and Reg. £300.
Macclesfield General Infirmary.—Second H.S. At rate of £150.
Manchester, Ancoats Hospital.—Orthopædic H.S. At rate of £100.
Manchester Hospital for Consumption and Diseases of the Throat and Chest.—Res. M.O. for In-patient Dept., Bowdon, Cheshire. £200.
Manchester and Salford Hospital for Skin Diseases.—H.S. At rate of £100.
Manchester Royal Eye Hospital.—Jun. H.S. £120.
Manchester Royal Infirmary.—Dickinson Research Travelling Scholarship in Medicine. £300.
Middlesbrough Education Committee.—Sen. Asst. School M.O. £500.
Middlesex Hospital and Medical School, W.—Registrars. Each £300.
Middlesex Hospital, W.—Obstetric and Gynæcological Surgeons.
Newcastle-upon-Tyne Hospital for Sick Children.—Jun. H.S. Also Res. Sen. H.S. At rate of £100 and £95 respectively.
Prince of Wales's General Hospital, London, N.—Hon. Asst. Surg.
Queen Charlotte's Maternity Hospital, Marylebone-road, N.W.—Asst. Director of Research Lab. £750.
Queen's Hospital for Children, Hackney-road, E.—Res. M.O. £200. H.S. Also Cas. O. Each at rate of £100.
Radium Institute, Riding House-street, W.—Anæsthetist.
Royal Eye Hospital, St. George's Circus, Southwark, S.E.—H.S. and Asst. H.S. At rate of £150 and £100 respectively.
Royal London Ophthalmic Hospital, City-road, E.C.—Hon. Dental Surg.
St. Bartholomew's Hospital.—Two Chief Assts. to Dental Dept. Also Dental H.S. £80.
St. Mary's Hospital, W.—Med. Registrar. £200.
Samaritan Free Hospital for Women, Marylebone-road, N.W.—H.S. At rate of £100.
Sheffield Royal Hospital.—Ophth. H.S. At rate of £80.
Southampton, Free Eye Hospital.—Hon. Asst. Ophth. Surgeon.
South London Hospital for Women, South Side, S.W.—Physician to the Skin Dept.
Staffordshire Mental Hospital, Cheddleton, near Leak.—Asst. M.O. £600–£750.
Surrey County Council, Mental Hospital Committee.—Jun. Asst. M.O. £350.
Taunton and Somerset Hospital.—Jun. H.S. £100.
University College Hospital, W.C.—Second Asst. in Child Welfare Dept. £50. Also Hon. First Asst. for the Ear, Nose, and Throat Dept.
Walsall General Hospital.—Cas. H.S. At rate of £120.
Warwick, King Edward VII. Memorial Sanatorium. — Jun. Asst. M.O. At rate of £200.
Weir Hospital, Grove-road, Balham, S.W.—Sen. Res. M.O. £200.
Willesden General Hospital, N.W.—Clin. Asst. to Gynæcological Out-patients' Department. Also H.P. £100.
Willesden Urban District Council.—Asst. M.O. £600.
Wolsingham, Holywood Hall Sanatorium.—Asst. M.O. £350.

The Chief Inspector of Factories announces a vacant appointment for a Certifying Factory Surgeon at Southminster (Essex).

HOSPITALS AND GREYHOUND RACING. — The governors of the Miller General Hospital have returned a cheque for £20 sent from the Charlton Stadium as part of the proceeds of a charity greyhound racing meeting.

GIFT TO SALFORD ROYAL HOSPITAL.—The annual report of the hospital shows an income of £36,325, and an expenditure of £52,367, the deficit on the year's working being £16,032. The honorary treasurer, Mr. Leonard Sumner, has given £10,000 to the hospital and also an investment of £2500. Out of the 49,897 patients treated during the year, 19,427 were victims of accidents.